SCHOOL LIBRARY.

# Antiquity

A QUARTERLY REVIEW OF ARCHAEOLOGY

*Edited by Glyn Daniel*

**Vol. XXXV No. 140 DECEMBER 1961**

*Editorial* – – – – – – – – – – – – – – 257
J. K. S. ST.JOSEPH: *Aerial Reconnaissance in Wales* – – – – 263
M. V. GARAŠININ: *The Neolithic in Anatolia and the Balkans* – – 276
BRUCE DICKINS: *English Place-Name Studies since 1901* – – – 281
G. H. S. BUSHNELL: *Radiocarbon Dates and New World Chronology* – 285
R. J. C. ATKINSON: *Neolithic Engineering* – – – – – – 292
DAVID TRUMP: *Skorba, Malta and the Mediterranean* – – – – 300
D. R. BROTHWELL: *Cannibalism in Early Britain* – – – – 304
*Notes and News (see overleaf)* – – – – – – – – – 308
*Reviews (see overleaf)* – – – – – – – – – – 321
*Book Chronicle* – – – – – – – – – – – 275, 280
*Index to Volume* XXXV – – – – – – – – – – – 334

*The Antiquity Trust, Cambridge, England*

*Price: Single Copies* 10s 6d—*Annual Subscription* 30s (*or* 5 *dollars*)

ANTIQUITY was founded in 1927 by Dr O. G. S. Crawford. Since January, 1961, it has been owned by THE ANTIQUITY TRUST (Trustees: Professor R. J. C. Atkinson, Mrs M. Aylwin Cotton, Professor M. E. L. Mallowan, Mr I. D. Margary, Professor S. Piggott and Sir Mortimer Wheeler). It is published on behalf of Antiquity Publications Limited (owned and controlled by The Antiquity Trust) by Heffer of Cambridge.

© Antiquity Publications Ltd.

**ADVISORY EDITORS**

*Professor Dr Gerhard Bersu, Dr G. H. S. Bushnell, Professor M. E. L. Mallowan, Professor Stuart Piggott, and Sir Mortimer Wheeler.*

## NOTES AND NEWS

The Knossos Tablets: Some Clarifications (L. R. Palmer) – – – – – – 308
*The Cambridge Ancient History* – – – – – – – – – – 311
Two Radiocarbon Dates for the Kisalian (J. Nenquin) – – – – – – 312
New Radiocarbon Dates for Australia (Isabel McBryde) – – – – – – 312
Prehistoric and Romano-British Antiquities in the British Museum (R. L. Bruce-Mitford) 313
The Courtyard-House Site at Higher Bodinnar, Sancreed, Cornwall (P. A. S. Pool) – 314
The Administration of Roman Britain (J. C. Mann) – – – – – – – 316
Mediterranean Scholarship – – – – – – – – – – – 320
Notes and News for March 1962 – – – – – – – – – – 320

## REVIEWS

Clark, *World Prehistory—an Outline* (Robert J. Braidwood) – – – – – 321
Braidwood and Howe, *Prehistoric Investigations in Iraqi Kurdistan* (Joan Oates) – – 322
Oliver (Ed.), *The Dawn of African History* (Jack Goody) – – – – – – 324
Talbot Rice, *The Seljuks* (Seton Lloyd) – – – – – – – – – 325
Grosjean, *Filitosa et son Contexte Archéologique dans la Vallée du Taravo* (Warwick Bray) 327
Huxley, *Achaeans and Hittites* (Denys Page) – – – – – – – – 328
Rees and Rees, *Celtic Heritage: Ancient Tradition in Ireland and Wales* (T. G. E. Powell) 329
Deshayes, *Les Outils de Bronze, de l'Indus au Danube* (Stuart Piggott) – – – – 330
Boardman, *The Cretan Collection in Oxford* (R. W. Hutchinson) – – – – – 331
Pobé and Roubier, *The Art of Roman Gaul* (Olwen Brogan) – – – – – 333

**For Editorial Notices see inside back cover**

# Antiquity

VOL. XXXV No. 140 DECEMBER 1961

PLATES XXXIII–IV

## Editorial

THE death of the Abbé Henri Breuil on 14 August removes from the stage of world prehistoric scholarship one of the greatest scholars that ever graced its fascinating but often treacherous boards. Very few people—it is difficult to think of any—have contributed more than the Abbé to the development of the study of antiquity in the last hundred and fifty years since Thomsen opened the Copenhagen collections, and it could be said that prehistoric archaeology had begun as a humanity scientifically pursued. In any chronicle of the history of archaeology the name of Henri Breuil will justly have a most honoured place. As one of his very first English pupils has recently written in *Nature* Breuil was 'one of the world's few really great prehistorians, and it is the world, as well as France, that has suffered a loss by his death'. Miles Burkitt, who wrote these words, had known Breuil since he first met him in Cambridge in 1912; the Abbé was then thirty-six, and, says Burkitt, 'then, as always, of an electric character'.

In the very month of Breuil's death French archaeology celebrated the centenary of Lartet's publication of the *grottes* of Massat, Sevigné and Aurignac. To many of our generation it has seemed that Henri Breuil and the beginning of Palaeolithic archaeology belong together: but it was thirty-six years after Aurignac when, as a young man of twenty, he met Edouard Piette, and it was the sight of Piette's collection of carved and engraved objects from the Dordogne and the Pyrenees that determined his vocation to prehistory. Five years later the Congress of *L'Association Française pour L'Avancement des Sciences*, meeting at Montauban, heard of the discovery of Font-de-Gaume and Combarelles in 1901 and of the evidence which Daleau had produced at Pair-non-Pair and Rivière at La Mouthe. Despite violent criticisms of the authenticity and antiquity of these paintings and engravings, an excursion made to Les Eyzies persuaded most scholars that there was indeed such a thing as Palaeolithic art. We print here a photograph of the scholars grouped round the entrance to La Mouthe, a photograph taken in August 1902, and published half a century later in the Abbé's *Four Hundred Centuries of Cave Art*; it shows the Abbé as a young man of twenty-five standing between Chauvet and Rivière (PLATE XXXIII).

This was the occasion that made Cartailhac write his *Mea Culpa d'un Sceptique*, and in October of the same year Cartailhac took the young Breuil to see Altamira. 'Ce qui nous vîmes', wrote Breuil, 'nous plongea dans une inexprimable stupeur'. It was this amazement and appreciation that saw the beginning of our real knowledge and appreciation of man's oldest art. No one did more than Henri Breuil in the half century that separated the meeting at Montauban and the discovery of Lascaux in 1940 to authenticate and document Palaeolithic art.

Controversy of course there always was. Montauban and the visit to Altamira were the end of the controversy which started in 1880 when Marcelino de Sautuola's small daughter

penetrated into the low-roofed Altamira, saw the polychromes above her head and called out to her father '*Toros, Toros*' (a delightful story which appears in all the books but which, the Abbé Breuil told us, is untrue and part of the folklore of archaeology). The Abbé's life ended in controversies. Miles Burkitt in the obituary in *Nature* which we have already quoted said, 'He had only one really useful eye but with it he saw far more clearly than did other more normally equipped persons, and his intuitions were brilliant', but later goes on to say, 'As he got older and perhaps less sure of touch in his intuitions—his opinions about Rouffignac and the "white lady" of south-west Africa were decidely open to question—he did not become less pontifical'.

The Rouffignac controversy, now more than ever alive, was commented on in the obituary notices in two reputable English daily newspapers. *The Times* of London wrote (24 August, 1961): 'The controversy which arose in 1956 over the paintings in the cave of Rouffignac was rather a sad anticlimax to his great achievements in this field: his vehemently held opinion that the paintings were entirely genuine was seriously questioned by many of his colleagues'. And that distinguished French correspondent of what we must now learn to call *The Guardian* was even more outspoken: 'In later life', wrote Darsie Gillie (*The Guardian*, 22 August, 1961), 'his fellow prehistorians showed less and less confidence in his opinions. His assignment of the "White Lady" in the Brandberg, south-west Africa, to the second millennium B.C. on the basis of a comparison with Egyptian and Cretan antiquities (a field in which he was not competent) aroused sharp dissent. The seventeenth century A.D. has been proposed with perhaps greater probability. He also failed to carry conviction with many competent prehistorians when he declared authentic all the paintings in the Rouffignac caves. When the *Académie des Inscriptions* of which he was a member declined to discuss a communication he made on the subject . . . he swept out in a memorable whirlwind of soutane. He did not take his seat again for a long time'.

We, in this journal, and elsewhere, have tried for the last few years to suggest that all is not well with Rouffignac and perhaps some other newly discovered caves in the Midi. While the Abbé was alive many of our colleagues kept their views on Rouffignac to themselves: now, we understand, we may hear many things and many points of view. We would think that the time has come for an independent commission on Rouffignac *et al.*, and perhaps also for the French Government to take powers to own all the painted and engraved caves in France, so that there shall be no incentive for private enterprise in these matters —and we use these words 'private enterprise' advisedly. But of course, whereas it is easy to schedule dolmens and hill-forts, it is much more difficult to deal with caves. Yet the painted and engraved caves of France and Spain are an international heritage.

Perhaps the most surprising comment on Breuil's death was in *The Sunday Telegraph* for 27 August, in a paragraph entitled 'Painting the Lily' in the 'London Week by Week' feature. This is what it said:—

> Many cave-paintings in France owe their fame and authentication entirely to the Abbé Breuil, whose death was announced last week. Some of the most charming at Les Eyzies in the Dordogne are, however, still inaccessible. When I last visited them, I was told they were 'closed for re-painting'.

Although we have been assured by the Editor of *The Sunday Telegraph* that this is a correct piece of reporting, we can find no one else who has seen such a notice. If it really existed it no doubt referred to something like the *Chateau Fort* at Reignac, an interesting attempt to provide a museum of life in Palaeolithic times in the Dordogne, with walls

deliberately painted—and very well painted—in Palaeolithic style by a modern artist, and with life-size scenes of men and animals. It certainly is *not* true that any of the Les Eyzies caves are 'still inaccessible'. But of course with even such a trivial example of genuine misapprehension, may a *canard* begin.

It is always difficult to nail a lie, to rub out a *canard*, finally to dismiss unreasonable belief. There is no smoke without fire, we say; and it is perhaps as one of the pleasures of unreason that the desire to be convinced by the fictitious will persist, long after it has been proved that the smoke was merely Scotch mist and that there never was a fire. Such mist is far from being exclusively Scotch: it is an international agent of wish-fulfilment, the acrid tang of which can be savoured only by those prepared to shut their eyes and be led by the nose of faith. Otherwise, how are we to explain the strange story of the alleged Palaeolithic paintings at Bacon's Hole, near the Mumbles in the Gower Peninsula? The facts about this discovery are not in dispute and we are grateful to the present Lord Swansea for permission to quote from his father's notebook and press-cuttings.

In *The Times* for 14 October, 1912, under the heading 'The Most Ancient Painting in Britain: A discovery in Wales', we read, 'The first example in Great Britain of prehistoric cave painting of the kind already familiar to palaeontologists from the caves of the Dordogne, the south of France, the Pyrenees and the peninsula of Spain has recently been discovered on the walls of Bacon's Hole, near the Mumbles, by Professor Breuil and Professor Sollas'. We read how, after a survey of all the caves of Gower, Breuil and Sollas went into Bacon's Hole. 'On entering this, one of the investigators cried, "Les voilà" and the other "There they are". The article goes on to describe them—a series of red bands—and to say 'a deposit of stalagmite has formed over them and sealed them up, so that none of the paint can be removed by rubbing. . . . Similar bands have been described from the walls of Font de Gaume in the Dordogne. Thus Upper Palaeolithic paintings have been found, and now that they are known to occur in our islands further discoveries may be expected'.

The painted bands in Bacon's Hole were made in 1894 by a man called Johnny Bale from Oystermouth, an interesting character who made a fine Gower rabbit soup. An old Norwegian barque, the *Althea*, outward bound from Swansea with a cargo of anthracite coal was driven ashore. The salvage firm who bought the wreck of the *Althea* used Bacon's Hole to store their material. Lord Swansea, in his notebook for 17 October, 1912, says 'Mr Hodgens . . . asserted before us that he himself had seen the marks made by a workman with a ship's paint brush about 17 years ago. His firm bought the wreck of the barque *Althea* close by the cave. They used the cave to store salvage and the men often sheltered there from the wet. There was ship's paint there and one man whose name he gave picked up a paint brush on the shore and took it with him, and when larking in the cave, splashed paint at his mates and daubed the wall'.

The Palaeolithic paintings at Bacon's Hole are therefore without any doubt 'Johnny Bale his marks'. This fact was clearly apprehended by the first Lord Swansea, Colonel Morgan and others in October, 1912, was widely known, and was well published in *The Cambrian Leader* of 19 and 21 October, 1912. It is therefore saddening and surprising, but salutary, to note that in his Huxley Memorial Lecture for 1913 Professor Sollas still proclaimed their authenticity. Miles Burkitt in his *Prehistory* (1925) was, wisely, more cautious: they were 'of unknown age' (p. 15) or 'of any age' (p. 204). But in 1957, Geoffrey Grigson, in his *Painted Caves*, is deliciously savouring the acrid smoke of the non-existent fire when he describes the cave as perhaps exhibiting 'a very few markings in red ochre which are perhaps Aurignacian . . . what may be, after all, the only cave painting of the Old Stone Age in Great Britain'. Grigson was impressed by the fact observed by Sollas and Breuil, namely that the marks were covered by a thin glaze of stalagmite. That glaze had formed

between 1894 and 1912 and anyone who uses the stalagmitic-cover arguments to authenticate Palaeolithic painting (it is used at Rouffignac) should remember this and should observe the thick stalagmitic manifestations in many of our railway tunnels in western Europe. Johnny Bale is, in a kind of way, a minor hero in the history of archaeology, like Edward Simpson and Marcelino de Sautuola's daughter and the little dog Robot.

We warmly recommended the various bogus Druid and Neo-Druid organizations that lay claim to Stonehenge to build their own stone circles elsewhere (ANTIQUITY, 1961, 173) but we were surprised to learn that at least one of these odd bodies, in connexion with some of their autumnal equinoctial celebrations in Hampstead, had asked for permission to build a stone circle on Primrose Hill. Now it is surely within the rights of anyone to build a stone circle anywhere or to construct a fine transepted gallery grave to receive the remains of himself and his friends and relatives; the intriguing thing about the request of these 'Druids' was their allegation that they wanted to build this circle because there had been one on Primrose Hill in 1792 and the *Gentleman's Magazine* said so.

Let us try and nail this lie once for all. There has never been a stone circle on Primrose Hill, and there was not one there in 1792. But first, the account in the *Gentleman's Magazine* for October, 1792, under the heading 'Domestic Occurrences' and dated Saturday, 23 September: 'This being the day on which the autumnal equinox occurred, some Welsh Bards, resident in London, assembled in congress on Primrose Hill, according to ancient usage. . . . The wonted ceremonies were observed. A circle of stones formed, in the middle of which was the *Maen Gorsedd*, or altar, on which a naked sword being placed, all the Bards assisted to sheathe it'. Now all this was an invention of Edward Williams (*Iolo Morgannwg*), that remarkable stone mason from the Vale of Glamorgan who mixed so much of a genuine knowledge of the past of Wales with fancies, frauds and false imaginings. And what he set out on Primrose Hill was not a megalithic monument but a circle of pebbles. It was these pebbles he took with him to the Eisteddfod in Carmarthen in 1819 and in the grounds of the Ivy Bush Hotel laid them out as a circle for the Gorsedd of Bards. Those who want to know more about Iolo should consult Elijah Waring's *Recollections and Anecdotes of Edward Williams* (London, 1850) or G. J. Williams's *Iolo Morgannwg* (Cardiff, 1956) with a warning that the latter splendid book stops at 1788 and is written in Welsh. We print here the frontispiece of Waring's book on Iolo (FIG. 1).

But the absence of authority for a proper stone circle on Primrose Hill should not deter the Druids or any other unreasonable religious body from constructing megalithic monuments. Stone circles are annually built by the Gorsedd of Bards of the Welsh Eisteddfod. A circle was built on a cliff overlooking the Columbia River at Maryhill (Washington) in the 'twenties of this century. It is called *Stonehenge* and was erected by Samuel Hill as a World War I memorial. It consists of two circles and two ovals with an altar stone in the centre. We quote from the official description, kindly supplied by Dr Bu'lock (as is the photograph, PLATE XXXIV): 'The outer circle has 30 upright stones 16 feet in height, and the inner circle consists of 40 stones 9 feet in height. The ovals consist of five pairs of trilithons . . . rising gradually to a height of 28 feet. The center altar stone is 18 feet in length'. We understand from Professor Cohen of Harvard that there is another Stonehenge built in Connecticut after World War II and we would value information and photographs of this and any other recent stone circles built in America.

Conscious antiquarianism is one thing: Stonehenges in Washington and Connecticut like stockbrokers' Tudor in Surrey are fun, just as the Margate Grotto and all follies are

*Fig.* 1. *Engraving by R. Cruikshank of Iolo Morgannwg, which appeared as the frontispiece of the book* Recollections and Anecdotes of Edward Williams.

fun. The problem in archaeology is when to stop laughing. It is not fun to make fakes of cave paintings and perhaps, incidentally, fools of genuine and serious archaeologists. But the genuine and serious archaeologists must always be on the look out for folly, fraud and someone else's fun. And they must always examine the facts. That was the real trouble about Rouffignac: the evidence of discovery and the facts of the affair were not properly studied because it all became involved in the personal act of authentication of the greatest-ever French archaeologist, whose death we mourn.

It would be sad if we allowed a divorce between the subjective judgement of archaeologists and the almost police judgement of facts. Breuil and Sollas never seem to have taken into account the known facts about Bacon's Hole, which would have stopped them from the error of their pronouncements in lectures in Cardiff and London. Lord Swansea wrote in his notebook 'If one desires to see similar marks there is no need to go down to Gower. There are plenty to be seen in the Swansea dry dock walls against the side of which brushes are cleaned everyday of the week'. We do not need a Maigret for Bacon's Hole, and we no longer need one for Piltdown Man, although the unravelling of that fake made, as Ellery Queen said, the best detective story of the year. But Inspector Maigret should

take a few weeks off from the Quai des Orfèvres and sit in the cafés in the Dordogne. I can see his thick-set form clutching his pipe as he travels in the railway that runs through Rouffignac. But we can only guess at what he says to Sergeant Lucas when, a glass of *Calvados* in his hand, and a *truffe sous la cendre* ordered for dinner, they exchange experiences as the mist settles on the river, the limestone cliffs fade out of sight, and the whistle of the Agen-Paris train reminds them that the provincial affairs of the Périgord are the concern of the whole archaeological world.

With this number ANTIQUITY completes its first year of publication for the Antiquity Trust. We are grateful for the continued support of our old subscribers and welcome the many new ones that have joined us in 1961. It is inevitable that the change should involve some dislocation, but we hope that by now all is well. Meanwhile if there is anyone who has not been receiving his copy regularly, will he please let us know. (We realize that this is a little like saying, 'Let me know if you do not get my postcard'.) May we remind those who have not yet paid their subscriptions for 1961 that these should now be paid to Antiquity Publications Ltd., 104, Hills Road, Cambridge. To all our subscribers we urge: *please fill in a Banker's Order and avoid the problem of reminders and invoices.* May we say that we think that a year's subscription to ANTIQUITY is a good Christmas present for any up and coming archaeologist—so is a season ticket to our ancient monuments, as the advertisement below by the Ministry of Works explains.


# the Season to Give!

The season of giving, and what better present to give than a twelvemonth Season Ticket to all Ancient Monuments in the care of the Ministry of Works.

In a colourful greetings gift card it makes a useful and thoughtful present. The Season Ticket admits to any of 600 famous and historic Monuments throughout England, Wales and Scotland including The Tower of London, Caernarvon Castle, Edinburgh Castle, etc.

Price of the gift card? Just 7/6d. On sale at many Monuments and H.M.S.O. Bookshops. Or it may be obtained by written application, accompanied by the necessary remittance, to:—

The Ministry of Works (C.I.O.),
Lambeth Bridge House, London, S.E.1.

The Ministry of Works, Scottish Headquarters,
122 George Street, Edinburgh 2, or

The Director (HB/AM),
Ministry of Works, Gabalfa, Cardiff.

# Antiquity

A Quarterly Review of Archaeology

*Edited by Glyn Daniel*

VOLUME XXXV

1961

ANTIQUITY was founded in 1927 by Dr O. G. S. Crawford. Since January, 1961, it has been owned by THE ANTIQUITY TRUST (Trustees: Professor R. J. C. Atkinson, Mrs M. Aylwin Cotton, Professor M. E. L. Mallowan, Mr I. D. Margary, Professor S. Piggott and Sir Mortimer Wheeler). It is published on behalf of Antiquity Publications Limited (owned and controlled by The Antiquity Trust) by Heffer of Cambridge.

© Antiquity Publications Ltd.

**ADVISORY EDITORS**

*Professor Dr Gerhard Bersu, Dr G. H. S. Bushnell, Professor M. E. L. Mallowan, Professor Stuart Piggott, and Sir Mortimer Wheeler.*

*Printed by*
W. Heffer & Sons Ltd.
Cambridge, England

# Contents, Volume XXXV


PAGE

*Editorial* – – – – – – – – – – – 1, 85, 171, 257

*Articles*

SINCLAIR HOOD: *The Date of the Linear B Tablets at Knossos* – – 4

MARGARET MURRAY: *First Steps in Archaeology* – – – – – 7

CLAUDIO VITA-FINZI: *Roman Dams in Tripolitania* – – – – 14

CHARLES GREEN: *East Anglian Coast-line Levels since Roman Times* – 21

SHEPPARD FRERE: *Civitas—A Myth?* – – – – – – – 29

D. J. MULVANEY: *Australian Radiocarbon Dates* – – – – – 37

J. D. COWEN: *The Late Bronze Age Chronology of Central Europe* – – 40

J. V. S. MEGAW: *Across the North Sea* – – – – – – – 45

DIMITER P. DIMITROV: *Seuthopolis* – – – – – – – – 91

SONIA COLE: *Forgeries and the British Museum* – – – – – – 103

CHARLES McBURNEY: *Aspects of Palaeolithic Art* – – – – – 107

HECTOR CATLING: *A New Bronze Sword from Cyprus* – – – – 115

G. W. DIMBLEBY: *The Ancient Forest of Blackamore* – – – – 123

P. ASHBEE and I. W. CORNWALL: *An Experiment in Field Archaeology* 129

L. R. PALMER: *The Find Places of the Knossos Tablets* – – – – 135

DANIEL SCHLUMBERGER: *Sir John Marshall and Gandhāra Art* – – 176

KARL RIEHM: *Prehistoric Salt-Boiling* – – – – – – – 181

BEATRICE BLANCE: *Early Bronze Age Colonists in Iberia* – – – 192

V. M. MASSON: *The First Farmers in Turkmenia* – – – – – 203

JUDITH WILKINS: *Worsaae and British Antiquities* – – – – – 214

GLANVILLE JONES: *Settlement Patterns in Anglo-Saxon England* – – 221

J. K. S. ST.JOSEPH: *Aerial Reconnaissance in Wales* – – – – – 263

M. V. GARAŠININ: *The Neolithic in Anatolia and the Balkans* – – 276

BRUCE DICKINS: *English Place-Name Studies since 1901* – – – – 281

CONTENTS


PAGE

G. H. S. BUSHNELL: *Radiocarbon Dates and New World Chronology* – 285

R. J. C. ATKINSON: *Neolithic Engineering* – – – – – – – 292

DAVID TRUMP: *Skorba, Malta and the Mediterranean* – – – – 300

D. R. BROTHWELL: *Cannibalism in Early Britain* – – – – – 304

*Notes and News* – – – – – – – – – – 53, 142, 233, 308

*Reviews* – – – – – – – – – – – 67, 157, 247, 321

*Book Chronicle* – – 20, 28, 36, 39, 102, 122, 134, 180, 256, 275, 280

*Index* – – – – – – – – – – – – – – 334


## EDITORIAL NOTICES


ANTIQUITY is published quarterly on the 1st March, June, September and December for Antiquity Publications Ltd., by W. Heffer & Sons Ltd., Cambridge, England.

The ANNUAL SUBSCRIPTION (including postage) is ONE POUND TEN SHILLINGS Sterling, or FIVE DOLLARS, *payable in advance to* ANTIQUITY, c/o W. Heffer & Sons Ltd., 104 Hills Road, Cambridge, England. SINGLE COPIES may be obtained for 10*s* 6*d*.

MSS (whether in the form of Articles or Notes) offered for publication should be sent to DR GLYN DANIEL, St. John's College, Cambridge, England. All MSS should be typewritten. The Editor is not responsible for the opinions expressed by contributors.

BOOKS for REVIEW should be addressed to the EDITOR OF ANTIQUITY, St John's College, Cambridge, England.

INDEX and BACK NUMBERS from W. Heffer & Sons Ltd., Booksellers, Petty Cury, Cambridge, England.

BINDING: John Bellows Ltd., Printers and Publishers of Eastgate, Gloucester, will continue to assist those wishing to bind their copies of ANTIQUITY. Binding cases only are 8*s* 6*d*; the cost of binding each volume is 15*s* (including case and return postage). Please write direct to John Bellows Ltd.

ANTIQUITY XXXV, 1961 PLATES XXXV–XLIII

# Aerial Reconnaissance in Wales

By J. K. S. St.JOSEPH

*In the last few years, widely ranging reconnaissance flights sponsored by the Committee for Aerial Photography in the University of Cambridge have been made over Wales for the purpose of archaeological and other research. Here Dr St. Joseph, the Curator in Aerial Photography at Cambridge, who planned these flights and undertook the photography, discusses some of the outstanding results of air photography in a region which has hitherto been neglected from this point of view.*

## 1. INTRODUCTION

The considerable body of photographs from Wales[1] now available demonstrates the value for archaeological and historical studies of this method of enquiry in such very varied terrain. The results obtained in these specially planned flights have also been supplemented by reference to the regional photographic survey undertaken by the Royal Air Force to meet the needs of Government Departments. A few air photographs are included in the recent volumes of the *Inventory of Caernarvonshire* issued by the Royal Commission on Ancient Monuments in Wales,[2] but there exists no published collection of air photographs illustrating the archaeology of Wales, and no guide for research workers who might wish to use such material.

Arable land in Wales, much rarer than in lowland England, comprises mainly the fertile and low lying tracts in Pembrokeshire, the Vale of Glamorgan, south-west Cardigan, the Vale of Ruthin, eastern Flint, as well as the lower courses of the larger rivers. In such country destruction of ancient sites by agriculture is most likely, and there also occur the best opportunities of discovering buried features by differences in colour of the vegetation (crop-marks), or of the freshly ploughed soil. The chance of discovery, however, varies with the crops, the soil, the type of agriculture and the weather, and part of the interest of such work arises from the ever-changing opportunities presented year by year. Cereal crops growing on soils derived from glacial and river gravels are amongst the most productive of information, but Wales offers such a variety of rocks and correspondingly complicated soil-patterns that conditions within even a small area defy generalization. In parts of Pembrokeshire, where the soils are weathered from Lower Palaeozoic rocks, crop-marks may appear, while in the Vale of Glamorgan buried ancient sites exist in arable land, but no crop-marks have been recorded in spite of repeated reconnaissance. Soils derived from Lias and Carboniferous Limestone do not seem there to afford conditions favouring differential growth of vegetation. The cultivation of so called 'marginal land', which may occur wherever ground is being newly cleared for afforestation or agriculture brings its own toll of destruction of ancient monuments, and corresponding opportunities for observation.

[1] The photographs on which this account is based are part of the Collection of Aerial Photographs of the University of Cambridge.

[2] *Inventory of Caernarvonshire* (Royal Comm. Ancient Mons.), vol. I (east) 1956, vol. II (central) 1960. Earlier *Inventories* covering the counties Montgomery, Flint, Radnor, Denbigh, Carmarthen, Merioneth, Pembroke and Anglesey were published between 1911 and 1937.

The wide tracts of grassy moorland, untamed by agriculture, in the comparatively low ground of Anglesey or the Lleyn peninsula, or on the main mountain slopes, are amongst the areas where important discoveries are most likely. Reconnaissance there under the right conditions can enlarge our understanding both of major features like hill-forts, and of the many classes of minor earthworks such as native settlements and their fields, boundary-dykes, and groups of hut-circles. There is abundant scope for such studies and much work waits to be done. Scrutiny of already existing photographs taken to meet other needs may reveal earthworks unnoticed before, as much of the country remains archaeologically unexplored; but the best results will come from reconnaissance made specially for the purpose, when attention to such factors as lighting and the state of vegetation enable details to be recorded in a manner seldom seen in ordinary regional surveys. Examples will appear in the account that follows. Sometimes the photographs reveal new information, sometimes they suggest new interpretations of features already known.

For the earliest archaeological periods no man-made structures survive, but air photography can illustrate some of the environmental factors controlling the distribution of human settlements. Thus, air photographs can pick out the river-terraces, the coastal cliffs, 'raised beaches' and cave sites important in early times: views of Cors Gôch Glan-Teifi, the great peat-bog near Tregaron, in Cardiganshire, illustrate a type of vegetation formerly much more common in the highland zone of Britain than now. From the Neolithic period onwards, however, there is ever increasing evidence of man's occupation and use of land.

## 2. 'HENGE' MONUMENTS AND BARROWS

Little is known of 'henge' monuments in Wales, and one of the most interesting results of recent reconnaissance is the discovery of the complex of crop-marks at Llandegai (SH 593712),[3] near Bangor (PLATE XXXV). The site lies on a level plain of gravel, in a position commanding wide views. The northern of the two great circles visible in the photograph is nearly 300 ft. in diameter. It is enclosed by a broad ditch, the platform of the site being plainly visible on the ground. Faint marks in the interior raise the question whether there have been holes, perhaps for timber uprights. The southern circle, some 250 ft. in diameter and at 500 ft. distance, is defined by a smaller ditch seen to be interrupted at two narrow entrances. These circles, unmatched in Wales, resemble the earthen circles near Thornbrough, and on Hutton Moor, in Yorkshire, and like them must surely be 'henges'.[4] On the east side of the field, two parallel ditches form an elongated enclosure extending beneath the adjacent sports-ground. The proven length is some 400 ft.: the west end is slightly rounded. This enclosure seems very like a cursus; elsewhere in the same field are at least two ring-ditches, probably marking ploughed-out barrows. The association, so often found elsewhere, of 'henge' monument, cursus and ring-ditches, is interesting.

Stone circles lend themselves to air photography if they are clear of other upstanding features. The circle at Cefn Côch (SH 723747), south-west of Dwygyfylchi in Caernarvonshire, has been effectively photographed in oblique sunlight, when the stones are picked out by their shadows. Of long-barrows and cairns only large and well preserved examples yield telling photographs: the three huge cairns, of unknown age, on the summit of Foel Trigarn (SN 158335) in Mynydd Presely are seen in PLATE XXXVI (*b*). They appear to

[3] The references are to the National Grid.

[4] 'The henge monuments of Great Britain', in *Excavations at Dorchester, Oxon*, Atkinson *et al.*, 1951, 81–107.

have been somewhat altered in modern times. Barrows have been photographed near Llangwyfan (SH 328707), Anglesey, and on Garth Hill (ST 106837), in Glamorgan, while ring-ditches representing ploughed-out barrows occur at Llanddyfnan (SH 509784), also in Anglesey. Some of the barrow-groups in Brecknock and Glamorgan should yield telling photographs in oblique sunlight.

### 3. PREHISTORIC QUARRIES

Neolithic axe factories are not very rewarding subjects for air photography: at Graig Llwyd, Penmaenmawr, one of the most famous, modern quarrying has scarred the hill-top, but even at best photographs can show little more than the setting of these prehistoric industries. By contrast, the rock-outcrops around Carn Meini (SN 145325) in Mynydd Presely are a striking feature of the landscape (PLATE XXXVI (*a*)). The jagged outcrops are so different from the generally smooth slopes of neighbouring hills that they compel attention whether in distant view or close at hand. Much has been written of the mode of transport to Salisbury Plain, some 180 miles away, of the 'blue-stones' of Stonehenge, and of the route that was followed, but less about the question why rock from Presely was chosen at all.[5] The reason must have been peculiarly compelling. The fact that the stones of the original 'blue-stone' monument, wherever that stood, are considered to have been largely undressed, the shape of the monoliths being determined by the natural polygonal jointing of the rock, may suggest a reason. That the settings of stones in elaborate 'henge' monuments are to be derived from timber prototypes receives support from the presence on both the sarsens and the 'blue-stones' at Stonehenge of mortice and tenon, itself indicative of the quality of carpentry involved in timber monuments. To people who had in mind dressed timbers, might not a fine textured rock such as preselite[6] naturally jointed in polygonal columns, shaped as it were by Nature for a purpose, appear on account of its very rarity to have such magical significance that this naturally shaped rock was preferred above all others for these monuments? The reason for the use of preselite then becomes clear, for Carn Meini is the *nearest* place to Wessex where rock is to be found in naturally shaped columns. The striking outcrops of rock already mentioned lie close to an early trade-route for Irish gold, so that knowledge of the rock would easily spread.[7]

### 4. HILL-FORTS

The hill-forts of the Iron Age are amongst the most remarkable earthworks in Wales: although many have been planned in varying detail, their study whether by air photography or by excavation has only begun. Without careful field-examination, particularly of the large and complex sites, it is hardly possible to observe whether, for example, structural particularities distinguish hill-forts of the different tribal groups. However, a small selection of photographs from the large body of material available may illustrate such factors as choice of site and appreciation of possibilities for defence, while different phases of structural development may be distinguishable at complicated sites.

[5] 'Blue-stone' is a convenient term for the igneous rock used in the building of Stonehenge, but it hides the fact that at least four petrologically distinct varieties of rock are in question. Outcrops of all four varieties occur in a restricted area between Carn Meini (PLATE XXXVI (*a*)) and Foel Trigarn (PLATE XXXVI (*b*)).

[6] Rare examples of prehistoric stone-axes in preselite show that the rock was also known and quarried for this purpose.

[7] For an alternative explanation cf. Atkinson, *Stonehenge*, 1956, 173–175.

The hill-fort at Twmbarlwm (ST 243926), near Crosskeys in Monmouthshire, seen in PLATE XXXVII (*a*), has but a single rampart and ditch which enclose the level crest of a ridge. Here the ditch seems to have provided all the rampart material, and no special quarry-pits are visible. The defences are interrupted for a gate on the south-east: a fine castle-mound straddles the Iron Age defences near the highest point of the camp at the north-east end. The hill-fort at Llanblethian (SS 984743), near Cowbridge in Glamorganshire, where the rampart and ditch remain in fair condition, is of unusual interest in that low earthworks are seen to cover much of the interior (PLATE XXXVIII (*a*)). These earthworks somewhat resemble remains of a deserted medieval village, but whatever their age, excavation is needed to define their relationship to the defences of the hill-fort itself. The wide range of Iron Age forts in Gower will repay detailed study. In the north lies Cil Ifor (SS 506925), a commanding hill-fort with defences which are still impressive, though much weathered. On the south coast, a small promontory-fort (SS 432864), defended by two widely-spaced lines of rampart and ditch resembles the cliff-top 'castles' of Cornwall or Brittany. At the west end of Gower, the earthworks on Llanmadog Hill (SS 443927) and Hardings Down (SS 437906) are of special importance (PLATE XXXVII (*b*)). These sites afford, by reason of the fine preservation of their earthworks, unusual opportunities of studying the development of defences at small fortified settlements. Here the distinction between 'hill-fort' and 'defended settlement' becomes difficult to draw.

The hill-fort on Foel Trigarn (SN 158335) in the Presely Mountains, occupies a bleak, wind-swept summit 1200 ft. high. The photograph, (PLATE XXXVI (*b*)), shows the tumbled ruin of the ramparts that encircle the hill on its accessible sides, and the numerous 'platforms' delved into the hill-side, which must surely represent hut-positions. The greater part of the area within the outer rampart is occupied by these 'platforms', some of which appear to be overridden by the inner defences. Such extensive indications of hut-positions are rare, and here the chance is due to the remoteness of the site and to lack of interference by agriculture. Another Pembrokeshire hill-fort on the equally exposed rocky summit of Carn Ingli (SN 063373), 1158 ft. high, is illustrated in PLATE XXXVIII (*b*). The ruined stone rampart enclosing the long, narrow crest is clearly visible, while the maze of stone-built enclosures within should have much to reveal about the internal planning of this site.

Other notable hill-forts in south Wales lie at New Tredegar (ST 289869), on the western outskirts of Newport, where several phases in the construction of the defences appear, and at Pen y Crûg (SO 028303), 1½ miles north-west of Brecon, where fine triple lines of rampart and ditch give defence in depth. At Pen y Crûg the defences appear to have been planned at one time, though the way in which the outer rampart bifurcates on both north and south fronts suggests that later refurbishing has taken place. The in-turned ends of the main rampart at the single, south-east gate are clearly visible. Three miles to the south-west lies the small hill-fort, Tŵyn y Gaer (SN 989280), 1200 ft. high. The rampart and ditch, of modest dimensions, are interrupted on the east for an oblique entrance, at a point where the line of the defences is slightly staggered. Several straight lengths of earthwork occur on the slopes outside the fort: their age and purpose are intriguing questions. The remains have the appearance of unfinished work such as might be made by men engaged on military exercises. The earthworks known as Castell Dinas (SO 179301), also in Brecknockshire, on an outlying spur of the Black Mountains (1470 ft. high) 2¾ miles south-east of Talgarth, occupy almost as striking a position as any hill-fort in south Wales. A detailed plan both of the Iron Age defences and of the castle earthworks superimposed upon them is much needed.

In central Wales a number of well preserved hill-forts lie in the Severn and Teifi valleys and elsewhere. Cefn Carnedd (SO 016899), 1½ miles south-west of Caersws, in Montgomeryshire, occupies a notable position on a ridge-top commanding the upper Severn valley and several of its tributaries as did the later Roman fort at Caersws. The defences, evidently of great strength, are now best preserved at the north-east end, where the relative position of the three ramparts suggests work of more than one period. There too is a small outwork or annexe. After the conquest of central Wales the Roman command would scarcely tolerate the occupation of such a site overlooking the fort at Caersws.

Three Cardiganshire hill-forts, all in the Teifi valley, Castell Goetre (SN 603509) and Allt Gôch (SN 593501), both north-east of Lampeter, and Pen Coed-foel (SN 425428) all repay photography in oblique sunlight, though the earthworks of the first are masked by hedges. Further north, the large hill-fort near Trawscoed (SN 661730), on a ridge overlooking the Ystwyth, is manifestly of two periods, while the hill-fort, Gaer Fawr (SN 648719) a mile to the south-west has double lines of contour defences enclosing a flattish summit. At the one visible gate the rampart turns sharply inward to form side walls to a narrow entrance passage. Caer Penrhos (SN 553697), east of Lanrhystyd, an irregularly shaped enclosure defended by a single rampart following a contour-course, has superimposed upon it a small ring-earthwork of Dark Age or later date. Lastly, at Pen Dinas (SN 585804), south of Aberystwyth, air photographs display the striking position of the two fortified enclosures perched upon a ridge-top, commanding the mouths of the Ystwyth and Rheidol valleys.

In north Wales, the great hill-forts of the Clwydian range, Pen-y-cloddiau (SJ 128677) and Moel Fenlli (SJ 163600), together with Pen-y-corddyn (SH 915764), on a bare limestone hill south of Llandulas, exceed in size any of the forts hitherto mentioned. Such exposed sites can hardly have been permanently occupied: perhaps they are to be thought of as the main refuge-citadels of the Deceangli, occupied only in time of need. The problem here for air photography is to secure the right lighting-conditions: the heather that masks much of the first two forts obscures detail and is too dark-toned for shadows to stand out. Of smaller hill-forts, photographs of Moel-y-Gaer (SJ 148617), on a south-western spur of Moel Fammau, show the distinctive plan of the gate-ways, with the rampart sharply inturned on either side of a narrow entrance passage. Caer Caradog (SH 968479), the well known hill-fort south-east of Cerrig-y-Drudion, seems to show remains of a smaller enclosure within the main earthworks. Moel Goedog (SH 613325), north-east of Harlech, in Merionethshire, a small hill-fort at an altitude of some 1200 ft., has defences of distinctive plan with two widely-spaced circuits of rampart and ditch. Full descriptions of the Caernarvonshire hill-forts appear in the recent *Inventory* of the Royal Commission on Ancient Monuments in Wales. Many of the sites call for air photography under very oblique lighting when shadows might emphasize details of the earthworks. The development of the defences at Y Foel (SH 450507) could be studied with advantage in this way, while much information might be gained both of the defences and of the irregular stone-built enclosures within the hill-fort on Carn Fadryn (SH 280352) 4 miles south-west of Nevin. The most remarkable of the Caernarvonshire forts is the fortified hill-top citadel of Tre'r Ceiri (SH 373447), on the eastern summit of Yr Eifl, rising to a height of nearly 1600 ft. The photograph (PLATE XL (*b*)), gives a striking impression of the bare, scree-covered slopes, crowned by the great dry-stone wall, with parapet, rampart-walk and access-ramps, as well as of the well-preserved clusters of stone-built huts. The grouping of large and small huts may reflect social or other divisions within this native community.

### 5. SMALLER EARTHWORKS

The smaller hill-forts differ little in scale from defended native settlements, and some sites might be regarded as falling within either category. The earthworks on Llanmadog Hill (PLATE XXXVII (*b*)) and Hardings Down, in Gower, are closely matched on Mynydd Gaer, east of Briton Ferry. Of two sites there, one at SS 765942, is a small, sub-circular enclosure with two ramparts and ditches, and extensive outworks affording additional protection: the other, at SS 765935, on a summit at 1028 ft. has a single rampart and ditch. Sites, apparently of the same class lie on Mynydd Margam (SS 833882) and north of Llantrithyd (ST 038732), to mention but two examples in Glamorgan, while there are numerous small fortified enclosures in Pembroke, Cardigan and elsewhere that are rewarding subjects for air photography. Earthworks, first noted from the air on a ridge at ST 040790, in Hensol Park, Glamorganshire, seem to be remains of a small hill-fort or defended settlement.

The slight earthworks comprising hut-circles, enclosures of various sizes and sometimes field-boundaries, the remains of undefended native settlements often lying in hilly terrain, afford a more difficult subject for low level photography. No extensive collection of air photographs of such sites exists as yet, and here only a few that happen to have been covered in recent surveys are mentioned. Hut-positions and enclosures, outlined by ruined dry stone walls, mark a settlement at the head of the Rhondda valley (SN 922019). The contrast in tone between the dark stones and the rough grass happens to favour photography (PLATE XL (*a*)); under suitable lighting the settlements at Mynydd Cefn y Gyngon (SN 958032) and Mynydd Aberdare (SO 012052) should yield equally informative photographs. Earthworks, apparently remains of settlements and associated fields, have been recorded recently on the shelf (SH 623117) that stands high above the coast north-east of Llwyngwril, in Merionethshire, and undoubtedly other examples await discovery in surrounding mountainous country. A native settlement near St. Harmon (SN 996735), in Radnorshire, is illustrated in PLATE XXXIX (*a*). The compact earthworks of the settlement, and the irregular field-boundaries around it are clearly seen: the light-toned area is ground lately ploughed for the first time with inevitable damage to the earthworks.

In land, long taken in for agriculture, the small earthworks of these settlements are soon levelled by repeated ploughing, and the sites are thenceforth visible, if at all, only by differences of colour in the soil or vegetation. Some examples recorded in central Wales may be noted briefly. North-west of Castle Careinion (SJ 147067; PLATE XLIII (*a*)), an irregularly shaped enclosure, perhaps 200 ft. across, with three widely-spaced ditches, has been identified beside a minor tributary of the Banwy. Another lies on a small ridge above the Severn, north-west of Llandyssil (SO 185965). The ditches, forming an irregular quadrilateral with rounded angles are visible in terms of crop-marks. Barely $\frac{1}{3}$-mile to the south-east, at SO 192962, is a similar example. Near Arddleen (SJ 259163), on a low ridge a mile west of the Severn, a larger and more elaborate enclosure with two ditches has been seen. Near Llanrhaiadr (SJ 124266), in Denbighshire, part of the outline of a more regularly planned enclosure, with three ditches on the north side was visible. Some 4 miles to the east along the Tanat valley, near Llangedwyn (SJ 179244), a small fortified site on a low ridge, defended by two broad ditches set wide apart, appeared as parch-marks in rough grass. This list of recent discoveries from within one comparatively small area illustrates the range of information to be expected from planned reconnaissance repeated year by year.

## 6. ROMAN WALES—MILITARY

Some results of the application of aerial survey to the study of 'Roman Wales' have already been published,[8] so that a full account is unnecessary here, though the principal discoveries may conveniently be summarized. The Roman period brings us into touch with history, so that photography can be used to amplify historical evidence, itself often meagre. Moreover, aerial observation is unrivalled as a means of studying the influence of topography upon human affairs. Many aspects of the military organization of a frontier province, sometimes even the course of Roman campaigning, are susceptible to this treatment. Study of the map of Roman Wales shows gaps in our knowledge of the military system and suggests where further elements of the system are to be sought. Compared with the frontier in north Britain, few temporary camps are known, while knowledge of the network of roads and forts is evidently incomplete. Military control was based upon cohort-forts at strategic points, usually in valleys, linked by roads that followed either a valley or a convenient ridge-route. This network implies that thorough reconnaissance of the whole country took place following conquest of the native tribes, among whom the Silures and Ordovices offered the main resistance.

Recent discoveries illustrate different aspects of the Roman army's work of conquest and control. Large temporary camps have been identified, from regional photographic cover taken by the Royal Air Force, at Blaen-cwm-bach (SS 796987), Twyn y Briddallt (ST 002982) and Pen-y-coedcae (ST 066881), all in Glamorgan, at Arosfa Gareg (SN 802263) in Carmarthen, and at Pen-y-Gwrhyd[9] (SH 660557), east of the pass of Llanberis, in Caernarvonshire. Flights planned for archaeological reconnaissance have yielded a large camp near Ystradfellte (SN 924164), in Brecknock, and smaller camps at Cwm y Cadno (SN 812314), in Carmarthenshire and near Caersws (SO 040924), in Montgomeryshire. The first four, together with Ystradfellte, may be the work of Roman troops engaged in operations against the Silures. The series is incomplete, but the situation of the known camps is a guide in the search for further examples. The earthworks lie on high, bleak moorland, which does not always afford very even ground, but the deeply incised river valleys of south Wales, with their possibilities for ambush, were avoided.

The choice of good routes by which a large military force might enter south Wales is limited. By passing south of the Malvern Hills and north of the Woolhope Dome, so as to avoid the obstacles of the small wooded hills between Woolhope and Chepstow, the Wye valley is reached near its confluence with the Lugg. That some such route was indeed used is suggested by the 25½-acre fort at Clyro (SO 227435), in the Wye valley near Hay, now shown by air photography and field survey to be in all probability an advanced base, where troops could wait poised to strike south into the heart of Silurian territory or west to the Towy valley and beyond. No comparable advanced base in north Wales is known. However, it is interesting to observe that the earlier of the two forts at Kinvaston[10] (SJ 908115), in Staffordshire, corresponds closely in size (26 acres) with Clyro, and these are the only two forts known in Britain of such a size, about half that of a legionary fortress. Kinvaston is well placed for troops to advance into Wales, either northwards to the Dee and thence by a coastal route, or westwards to the upper Severn.

[8] *J.R.S.*, XLIII, 1953, 85–87; XLV, 1955, 88; XLVIII, 1958, 95–97; LI, 1961, forthcoming.

[9] Blaen-cwm-Bach, Twyn y Briddallt, Pen-y-coedcae and Pen-y-Gwrhyd were identified by officers of the Royal Commission on Ancient Monuments in Wales, Arosfa-Gareg by Mr J. F. Jones.

[10] *J.R.S.*, XLVIII, 1958, p. 94, fig. 8.

No temporary camps that might afford a clue to the course of operations have come to light. A well known incident, however, that occurred in A.D. 51, early in the Roman advance upon Wales, was the famous stand of Caractacus and his defeat after an assault by Roman troops on a prepared position chosen so as to invite attack. This took place in Ordovician territory, but such clues as may be gleaned from Tacitus[11] do not enable the site to be readily identified. The country was 'hilly' and there is mention of a river large enough to call for reconnaissance of a passage for troops. The defences of the native position had been hastily prepared to resist an assault evidently anticipated. Escape was possible, presumably away from the direction of the Roman advance, perhaps deep into north Wales and thence to the territory of the Brigantes.

While study of the topography suggests several possible sites, depending on what hills and river are thought to be in question, appreciation of the contemporary military situation helps materially to limit the choice. By A.D. 50, legionary fortresses had been established at both Gloucester and Wroxeter, implying Roman control of the southern and middle Marches, most likely gained by seizing the important natural route leading from the Severn at Wroxeter, by the Church Stretton valley and the Aymestrey gap, to the Wye valley near Hereford. Thus when Caractacus chose to move, in face of a threatened Roman advance upon the Silures, to the lands of the Ordovices, his route must have lain west of the Roman advanced line. A march by way of the upper Wye to the Severn, or through the hills on one side or other of these valleys are possible alternatives.

At Caersws, above Newtown, where several tributary streams enter the main river, the valley of the upper Severn widens to form a great bowl surrounded by hills (FIG. 1): the widening of the Dee valley near Corwen is somewhat comparable. If this great natural amphitheatre may be thought of as the focus of the south-easternmost sept or division of the Ordovices, their defended citadel must surely have been Cefn Carnedd (SO 016899), a prominent ridge west of Caersws still crowned with the earthworks of a hill-fort (cf. p. 267 above). This hill dominates the lower ground on either side of it and would so catch the eye of anyone advancing up the Severn as to invite attack. A hill-fort as such would not, indeed, enter into the tactical and strategical considerations involving the use of the large forces that Caractacus had assembled. Cefn Carnedd, however, lies at the north-east corner of a quadrilateral group of hills, 3 miles across, all but surrounded by wide valleys. It is an isolated defensible area unmatched in this part of Wales, and is the best centre from which to maintain contact with both the Silures and the Ordovices by easy natural routes, when the main route through the Marches has been lost. In strategic significance the position is as striking as that of Stanwick, the scene of the comparable Brigantian last stand twenty years later.

In detail (FIG. 1) the Severn forms the boundary of the quadrilateral to south and east, the Tarannon and Cerist to north and west flowing in a notably wide valley[12] with a marshy floor. Here are to be found all the features mentioned by Tacitus: ample gathering-ground for large tribal forces determined to make a last stand, steep hill-sides with occasional easier lines of approach which could be blocked by temporary defences, and a river with uncertain crossing,[13] namely the Severn, to be negotiated by the attacking force of legionaries

[11] Tacitus, *Annals*, book XII, chapters 33 and 35.

[12] This valley, larger than that of the Severn between Llandinam and Llanidloes, may well have been eroded by the Clywedog or even by the Severn itself: the river-system here has a complicated geological history and diversions have occurred.

[13] The Tarannon valley, though wider than the Severn, has a flat, marshy floor, unsuited for mounting an attack.

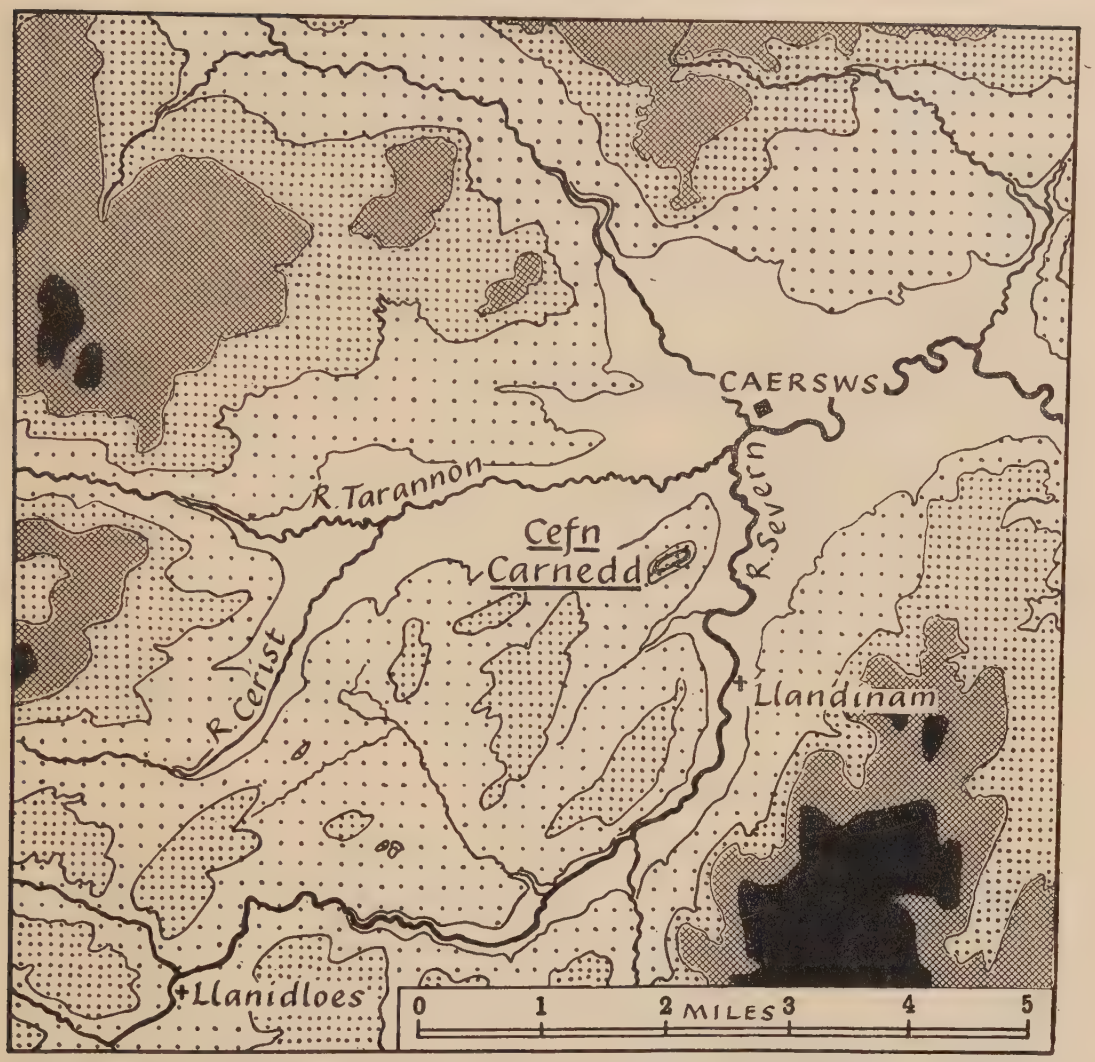



*Fig. 1. Cefn Carnedd area, Montgomeryshire. Map showing the quadrilateral grouping of hills between the Severn and Tarannon valleys. (Contours are drawn at 500 ft., 800 ft., 1100 ft., and 1400 ft. Land above 1400 ft. is shown in black).*

and auxiliaries. Finally there is a good escape route westwards across the neck of land between the Clywedog and Cerist valleys.[14]

The Roman forts in Wales, considered as subjects for air photography, present their own problems and require study under carefully chosen conditions which vary with the

[14] The Breidden Hills and Long Mountain on the borders of Shropshire and Montgomery have often been linked with this battleground. But these hills lie in the territory of the Cornovii not the Ordovices, and there would be no need to force a river-crossing since the ridge can easily be approached from the east, while the Severn valley to west cuts off escape.

nature of the site. At Tomen-y-Mur[15] (SH 706387), in Merionethshire, very oblique lighting would emphasize not only the remains of the fort (PLATE XLI (*b*)) but also the many small earthworks outside it. Opportunity to examine forts under cereal crops does not come very often: at Forden Gaer reconnaissance yielded part of the street-plan, at Clyro, Pennal and Llandovery, elements of the ditch-system, while at Caersws the street-plan appeared as parch-marks in drought, and at Gelligaer the rectangular earthwork lying to the north of the excavated fort was visible by reason of the white soil-marks of its ramparts, suggesting construction in turf or clay. This is surely an early fort. Discoveries in the last few years have come from field observation combined with air photography; a ground survey sometimes suggesting features to photograph, reconnaissance from the air sometimes revealing sites to be visited.

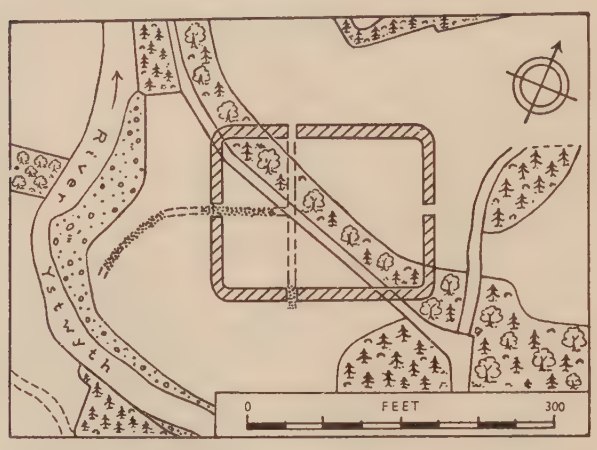



*Fig. 2. Sketch plan of Roman fort, Trawscoed, Cardiganshire.*

Thus the 5-acre fort at Trawscoed (SN 671727), on the Ystwyth in Cardiganshire was identified on the ground in 1959: subsequent air photography (PLATE XXXIX (*b*)) added the street-plan and the line of the Roman road to the river-crossing (FIG. 2). The ½-acre fort at Brithdir (SH 773188), in the Wnion valley, was also found by survey on the ground, in 1961, though its relation to the Roman road is best appreciated in an aerial view. The 2½-acre fort at Coed-y-caerau (ST 379917), 2½ miles east of Caerleon, in Monmouthshire, was first observed from the air and its character confirmed by inspection on the ground. The clue to the identification of the Roman fortlet, ⅓-acre in area, on Mynydd Myddfai (SN 821310), in Carmarthenshire, was provided by a rectangle marked in broken outline on the large scale Ordnance map,[16] and here recognition as a Roman fort came from air reconnaissance and ground observation combined. The small earthwork at Pen y Crogbren (SN 855935), in Montgomeryshire, was examined and photographed from the air in 1947, but opportunity to visit the site only came in 1961, when its identification as a Roman fortlet, 82 ft. by 73 ft. in size, was seen to be in no doubt.[17]

An interesting circumstance is the occurrence outside at least six forts in Wales of 'practice-camps'—small camps, 100 ft. square, more or less, constructed by Roman troops in training. The largest group of these camps, some eighteen in all, lies on Llandrindod

[15] *Arch. Camb.*, 93, 1938, 192–211; Nash-Williams, *The Roman Frontier in Wales*, 1954, 35–37.
[16] Ordnance Maps, 25-in. scale, Carmarthenshire, sheet XXVII, 7 (1906 edition).
[17] Trial-trenches dug by Mr Putnam in 1960 showed the rampart to be of turf.

Common, between 1 and 2¼ miles south of the fort at Castell Collen in Radnorshire. Since their discovery[18] in 1811, some have been built over and others denuded by agriculture, but air reconnaissance combined with field-survey has identified the position of ten. South-west of the fort at Caerau,[19] in Brecknockshire, a single practice-camp has been identified (at the point SN 920500) from a photograph taken by the Royal Air Force. On Gelligaer Common, 1¼ miles north of the fort at Gelligaer, four examples are known.[20] Three more, two on Mynydd Carn-Gôch (PLATE XLI (*a*)) and one on Stafford Common, some 4-miles south of Pontardulais, in Glamorganshire, no doubt represent exercise-works of troops garrisoning an as yet unidentified fort that must surely have existed to guard the crossing of the river Loughor by the Roman road from Carmarthen to Neath. Yet another such camp, again identified from photographs taken by the Royal Air Force, lies 2½ miles south-west of the fort at Caer Gai in Merionethshire. Lastly, near Tomen-y-Mur, seven practice-camps are now known. Five of these, at Dolddinas (SH 735378), 2 miles east of the fort, were recognized by Mr G. D. B. Jones[21] from Service photographs, the other two, close to the fort itself, were found by the writer.

Knowledge of the Roman road-system in Wales is far from complete. Air photography can help in tracing Roman roads by revealing actual remains to the east of Forden Gaer (Montgomeryshire), on Hirfynnydd (Glamorganshire), east of Coelbren (Brecknockshire), and on Trecastle Mountain (Brecknock-Carmarthenshire); or by identifying a general alignment, as of the course of the road in the Wnion valley, in Merionethshire. Moreover, detailed appreciation of topography, best gained by observation from the air, greatly helps in elucidating a Roman road-system in mountainous terrain, as for example, between the Dovey and Wnion valleys, or in central Wales.

## 7. ROMAN WALES—CIVIL

Little information about civil sites has been gleaned from air photographs. The known *villae* in the vale of Glamorgan seldom promote crop-marks, but there, and in south Carmarthenshire, further sites may be expected. Remains at Llanfrynach (SO 068257), in Brecknockshire, may be visible some year under a cereal crop, as the field concerned is occasionally ploughed. Crop-marks recorded near Caldicot (ST 483874), in Monmouthshire, may well indicate a ditched enclosure round a *villa*. Some of the roughly circular earthworks with one or two ditches in Carmarthen and Pembroke are probably native agricultural settlements, of which Cwm Brŵyn (SN 253122) and Trelissey (SN 174078) are excavated examples.[22] At Ford (SM 948265), in Pembrokeshire, settlements in the native tradition occur in proximity to a *villa* or farm. Evidence of civil settlements (*vici*) has been noted as but a few forts: near Tomen-y-Mur and Caer Gai earthworks are visible, and at Forden Gaer, where the settlement may have been extensive, crop-marks occasionally appear. More information is to be expected there, particularly on the level ground to east and north of the fort.

[18] By Thomas Price. Professor E. B. Birley first identified the camps as practice-works.

[19] Recently recognized by Mr G. D. B. Jones, *Bull. Bd. Celtic Studies*, 17, 1958, 309–315. The practice-camp was found by the writer. *J.R.S.*, 48, 1958, 96.

[20] For details of the camps on Gelligaer Common, Mynydd Carn-Gôch and Stafford Common see *J.R.S.*, LI, 1961, forthcoming.

[21] Who also identified the camp south-west of Caer Gai.

[22] Nash-Williams, *The Roman Frontier*, 1954, 83–87, figs, 41–42 and footnote 4 on p. 87.

## 8. DARK AGES

Visible remains of the Dark Ages are important and varied but little systematic exploration by aerial survey has yet been undertaken. Photographs of great linear earthworks, such as Offa's Dyke, demonstrate the character of the remains and the choice of route. Smaller dyke-systems, such as those south of Dolfar, at the border of Montgomery and Radnor, are deserving of study and present their own problems. The fortified settlements of south-west Wales constitute a considerable body of material that calls for special treatment. Many of the small earthworks resemble, in their size and position, Irish raths: often the remains can hardly be dated by inspection. Pembrokeshire examples range from sites like Castell y Ffuwch (SN 024291), near Castlebythe, Vaynor Gaer (SN 094171), near Llawhaden, having a substantial earthen bank and ditch with a single entrance (PLATE XLII (*a*)), and Caerau Gaer (SN 139161), near Llanddewi-Velfrey, to more elaborate enclosures such as the earthworks $\frac{3}{4}$ mile north of Ludchurch (SN 146117). At Vaynor Gaer quantities of burnt earth and daub could be seen in 1960 scattered over the surface after the ground had been first ploughed for a good many years. At Ludchurch, where two ring-sites lie close together on the same ridge-top, the easternmost (PLATE XLII (*b*)), now partly levelled for agriculture, seems to show defences of more than one period. Scollock 'rath', near Walton East (SN 018243; PLATE XLIII (*b*)) is an interesting variant, having a small out-work which has to be crossed to reach the entrance to the main enclosure. The earthworks at Coed-y-caerau (ST 378914), in Monmouthshire, lying immediately west of the Roman fort mentioned above, appear to be remains of a Dark Age fortified site, having several phases of construction.

## 9. LATER PERIODS

In later periods, air photography can be applied to illustrate an even wider range of human affairs, providing an important source of new material to be drawn upon for historical studies. Fortified sites of the Middle Ages range from great castles like Caernarvon, Conway and Caerphilly, to minor earthworks such as Castle Bryn Amlrug (SO 167846) and Tomen Bedd-Turc (SO 100696), in Radnorshire, where a distant view, comprehending ruins or earthworks in their setting, provides better material for interpretation than a plan or ground photograph can ever do. Study of the pattern of human settlement involving appreciation of the distribution of towns and villages and their individual plans, and the reclaiming of land from moorland waste, has much to gain from air photographs. Ancient towns like Carmarthen, St. Davids and St. Asaph, the 'plantation-towns' of Edward I, comprising successful ventures like Flint, Conway and Caernarvon, and failures like Bere and Abermule, can all be presented and studied in air photographs with such detail and emphasis that no map or plan can give. Progress of land-settlement and enclosure, often so different from that in England, can similarly be studied and displayed in photographs better than in any other way. Amongst minor earthworks, examples of fortified farms or homesteads must exist in some numbers. A site like Castell Llwyd (SN 118372), situated above a stream 2 miles west of Eglwyswrw, in Pembrokeshire, where two lines of bank and ditch of modest dimensions cut off the neck of a small promontory, may belong here: the substantial enclosures round certain monastic granges, like Mynachdy (SO 230697), in the upper valley of the Lugg, near Llangunllo, are in the same class. Ample material is available to illustrate dispersed farms and their fields in the main river valleys, or movements in the 'high-watermark' of cultivation as agricultural economies of different periods have brought variations in the extent of farming land. Ruined field-boundaries and land, once enclosed but now reverting to waste, to be seen on the west side of the Vale of Conway, on the slopes of Mynydd Presely, and in many other places, suggests that even

with the land scarcity of today, it is neither practical nor economic to use such areas other than for rough grazing.

That the rate of change in land use is greater than ever before seems characteristic of the present age. The landscape of Wales, as of many other parts of Britain, is changing as new building, industrialization, quarrying and mining, afforestation and agricultural development proceed at an increasing rate. Air photography is not only an invaluable means of discovery and illustration of ancient and historical sites, but can also provide a comprehensive and detailed record of the countryside of today, a survey that future historians, viewing even more drastic changes in use of land, may have cause to welcome.

*Contributions towards the cost of recent surveys from the Royal Commission on Ancient Monuments in Wales, from the Board of Celtic Studies, and from the Cambrian Archaeological Association are gratefully acknowledged.*

# Book Chronicle

*We include here books which have been received for review, or books of importance not received for review, of which we have recently been informed. We welcome information about books, particularly in languages other than English and American, of interest to readers of* ANTIQUITY. *The listing of a book in this chronicle does not preclude its review in* ANTIQUITY.

THE PRESTER JOHN OF THE INDIES. Two volumes, *pp.* 617, 16 *plates*, 41 *text-figures and maps. Cambridge, the University Press, for the Hakluyt Society*, 1961. 35*s.* each volume. The narrative of the Portuguese Embassy to Ethiopia in 1520 written by Father Francisco Alvares in the translation of Lord Stanley of Alderley (1881) revised and edited with additional material by C. F. Beckingham and G. W. B. Huntingford.

AFRICAN GENESIS. *By* ROBERT ARDREY. *Pp.* 380, 60 *figures, maps and drawings, two of them in colour. London, Collins*, 1961. 36*s.* Described as 'a personal investigation into the Animal Origins and Nature of Man'.

THE AGE OF THE SAINTS IN THE EARLY CELTIC CHURCH. (The thirty-second series of Riddell Memorial Lectures in the University of Durham.) *By* N. K. CHADWICK. *pp.* 166. *London, Oxford University Press*, 1961. 12*s.* 6*d.*

TIME OFF TO DIG: Archaeology and Adventure in Remote Afghanistan. *By* SYLVIA MATHESON. *pp.* 286, 24 *plates. London, Odhams Press*, 1961, 25*s.* An account of two seasons at the Casal excavations at Mundigak. Foreword by Sir Mortimer Wheeler, in which the book is succinctly reviewed.

BARBARIANS IN GREEK TRAGEDY: *By* HELEN H. BACON. *pp.* 201. *New Haven, The Yale University Press for Smith College*, 1961, 42*s.*

THE VIKINGS. *By* HOLGER ARBMAN. *pp.* 170, 48 *plates*, 44 *text-figures. London, Thames and Hudson*, 1961, 30*s.* Volume 21 in the 'Ancient Peoples and Places' Series, translated and edited with an introduction by Alan Binns.

ANCIENT GREEK HORSEMANSHIP. *By* A. K. ANDERSON. *pp.* 245, 39 *plates. Berkeley and Los Angeles, University of California Press*, 1961. $8.75.

SALT: A Study in Economic Prehistory. *By* JACQUES NENQUIN. *pp.* 162, 5 *maps*, 11 *plates. Bruges, De Tempel*, 1961, 3.30 Belgian Francs. Volume VI in the series 'Dissertationes Archaeologicae Gandenses'.

[*continued on p.* 280.

# The Neolithic in Anatolia and the Balkans

by M. V. GARAŠANIN

*Professor Milutin Garašanin of the Archaeological Institute at Belgrade, stimulated by Dr Mellaart's views on the early chronology of Anatolia and the Balkans published in* 1960 (ANTIQUITY, 1960, 270), *has written us this article believing that some of Mellaart's views, while generally to be warmly welcomed, are unjustified from the stand-point of method and chronology.*

SINCE 1907 when Professor M. M. Vasić first posed the question of the south-eastern connexions of the Neolithic culture of Serbia, the investigation of this problem over a wider field and on a broader chronological footing has made material advances in the whole area from the Near East to the Lower Danube.[1] It even proved possible to provide this problem with a more or less exact historical outline.[2] These results have been produced by exceptionally fruitful but unco-ordinated, local research: uncertainties and apparent contradictions have still to be resolved.

It is obvious that the extraordinary development of local research in individual areas means that many long accepted opinions must have undergone some correction in detail. This is, for example, the case with the Boian group, the all too early dating of which Mellaart has rightly attacked.[3] His proposed chronology, however, requires too late a date, as I have shown elsewhere and as will be again shown below.[4] Also the provisional contradiction stressed by Mellaart in the development at the transition from Neolithic to E.B.A. in Thessaly (Late Neolithic/Larissa—Final Neolithic/Rakhmani—Early Helladic) and Serbia (Vinča-Pločnik/Vinča C-D, contemporary with the Early Helladic culture) can only be removed by further investigation.[5] Likewise I think one is justified in critically checking the elements of the relative chronology of the Vinča group, which I had worked out earlier.[6] Mellaart's scepticism concerning the significance of a marble statuette and of the so-called Vinča face-lids in relation to Troy II, agrees completely with my own views of 1951 and 1954.[7] I would not, however, in any way agree with Mellaart in his denial of any genetical link between the earlier Vinča idol types (Vinča-Tordos I—Vinča A) and the Cycladic figures.[8] Not only in general type, but also in many details there is surely

[1] M. M. Vasić, *Annual of the British School at Athens*, 14, 1907, 318 ff.
[2] So for example F. Schachermeyr, *Die ältesten Kulturen Griechenlands*, 1955.
[3] J. Mellaart, ANTIQUITY, 1960, 270 ff.
[4] *Ibid.*, 272, and chronological table, p. 277.
[5] *Ibid.*, 270 ff.
[6] *Ibid.*
[7] M. Garašanin, *Hronologija vinčanske grupe*, 1951, 146, 190. The same, *Archaeologia Iugoslavica*, 1, 1954, 1 ff.
[8] Mellaart, *op. cit.*, 270.

complete correspondence.[9] Admittedly one has to acknowledge that due to the appearance of parallel idol types in the Neolithic (Hamangia), and even in the Early Neolithic cultures of the Balkans (Karanovo IB), the chronological importance of the Cyclades is considerably restricted, since a Central Balkan origin for these idol forms now becomes possible; indeed the chronological dependence of the Vinča types on the Cycladic development could become practically untenable.[10] On no account, however, can I share Mellaart's opinion regarding the pedestalled pots which are completely foreign in form, technique and decoration to the repertoire of the Vinča group; their origin is to be sought only in the Aegean-Cycladic area and they have, in my opinion, a special chronological importance.[11] It is well known that in evaluing the stratigraphy of the Vinča finds, Vasić took into consideration only the absolute levels and not the individual layers. It would possibly be best to assume that the pots in question may not belong to the group of finds coming from this level (Vinča-Tordos II—Vinča B), but rather to an unobserved pit of a somewhat later period (Vinča-Pločnik I—Vinča C). This view is strengthened by the fact that within the framework of the Vinča-Pločnik stage of the Morava area a gradual transformation of the Vinča group by elements of the E.B.A. (in its Aegean-Asia Minor meaning), can be observed. This change led also to the transformation of the Vinča group towards the culture of the early metal age.[12]

The latter observation brings us to an important problem of method: is one entitled, as Mellaart supposes and clearly expresses in his chronological table, to make a sharp division between separate cultural groups and stages, since in practice such a division completely excludes partial chronological juxtaposition and gradual evolution? Personally, I do not think so. Especially in the case of cultural transferences (i.e. everywhere, where a backward peripheral culture is gradually affected and transformed by the influence of a higher, more or less neighbouring cultural development), one can safely accept a chronological juxtaposition of older and younger features, as well as a local development of older elements. The relation of Vinča-Pločnik to the E.B.A. of the Aegean and Asia Minor mentioned above, provides a good example of this. Moreover, Mellaart himself partly accepts this view when he traces the development of the Macedonian E.B.A. (Kritsana) back to influence from Troy I, and accepts a further development of Trojan elements locally in Macedonia.[13] In the case of slow migrations also, such as are in part to be postulated in connexion with the spread of primitive Neolithic agriculture, one must always reckon with a similar juxtaposition. In this way, for example, one can explain the fact that in the settlement of Karanovo in Bulgaria, the early Starčevo stage (Karanovo I) is replaced in Karanovo II by the Veselinovo group, which belongs in its characteristics to the widespread complex of the Balkan-Asia Minor culture of the Later Neolithic. Meanwhile, on the other hand, somewhat further to the west in the East Macedonian settlement of Vršnik, in the levels Vršnik II–III one can follow a further development of Starčevo (Starčevo II, after D. Garašanin), together with separate Veselinovo elements securely stratified in a clearly

[9] Thus I saw in the Archaeological Museum at Athens stone idols from Naxos and Amorgos, with stumpy arms and a conical cap, which should be equated with types from Vinča; cf. M. M. Vasić, *Prestoriska Vinča*, III, 1936, fig. 562.

[10] For the Hamangia idols see most recently, D. Berciu, ANTIQUITY, 1960, 283 f., pl. XXXVIII. For Karanovo IB see, G. Georgijev, *Światowit*, XXIII, 1960, 309, fig. 7.

[11] Most recently M. Garašanin, 39 *B.R.G.K.*, 1958, 18, pl. 3, 6–7.

[12] Summarized *ibid.*, 23 f., and amplified in M. Garašanin, *Glasnik Zemaljskog muzeja*, IX, 1954, 5 ff., especially 25 f. Moreover this fact corresponds with the most recent views of V. Milojčić, *Germania*, 37, 1959, 70.

[13] ANTIQUITY, 1960, 272 f. and chronological table p. 277.

defined group of layers.[14] Not until Vršnik IV do later Starčevo types appear (spiral decoration—Starčevo III, after D. Garašanin), together with true early Vinča elements. This observation aims only at explaining that a gradual advance of the Balkan and Anatolian elements from the east burst through the earlier Starčevo group into more remote areas and led finally to the birth of the real Vinča group.[15] Only in the case of well organized, rapid migrations, associated with plunder and destruction, might a sharp division be adopted between earlier and later elements.[16] It seems to me that such a view is much better suited to the historical, evolutionary process than that rigid separation of each new chronological and cultural phenomenon, which in practice presumes a development by an endless series of catastrophes.

As a result of such an attitude as I have suggested towards the historical significance of the course of cultural evolution, as well as on a basis of firm archaeological observations (stratigraphical relationships, closed finds and cross-datings), many of the synchronisms in Mellaart's chronological table are in my opinion untenable. Here only the following most important examples are cited:

1. The sharp divorce between Karanovo II (Veselinovo) and Vršnik III (Starčevo II, after D. Garašanin) and the placing of Karanovo II in the time of Vinča-Pločnik (Vinča C-D) is untenable on the ground of the discussion above.

2. Equally unjustified is the late start of the Boian group, and in conjunction with it, that also of Pre-Cucuteni and Tripolje A. As has already been shown elsewhere, the early Boian stage (Guileşti) is repeatedly associated in finds with typical forms of the Starčevo group, whilst the Boian-Guileşti finds from the Vinča-Tordos settlement of Tordos presume a *terminus ante quem* before Vinča-Pločnik (Vinča C).[17] On the basis of the finds from Floreşti, where Boian-Guileşti, Starčevo and Tripolje A appear together, one can accept an analogous situation for the Pre-Cucuteni—Tripolje A development.[18] Thus we may suspect a chronological contact between Boian-Guileşti and Starčevo, which can be accounted for at the latest by a correlation of Boian-Guileşti with Vinča-Tordos I. Moreover in the latest Boian stage (Marica stage in Bulgaria) decorations appear which are to be connected in technique and pattern with the beginning of the Vinča-Pločnik stage (beginning of Vinča C) on the southern Morava and in the Kosovo area.[19] From this there follows readily the chronological correlation: late Boian = beginning of Vinča-Pločnik; hence too at least the early stages of the Gumelniţa-Cucuteni development are correlated with Vinča-Pločnik.

3. The question of the dating of the Bubanj-Hum group is worth special notice. Since certain finds of the Baden-Kostolac group appear, as is well known, in the stage Bubanj-Hum Ib–II, one can obtain therefrom some important key-points for a relative chronology connecting Central Europe and the Aegean-Asia Minor area.[20] Now Mellaart equates the stage Bubanj-Hum Ib (i.e. also Baden-Kostolac) with Troy I, whilst the Slatina group of the Morava valley, which follows immediately on the late Bubanj (Bubanj-Hum III), is

[14] M. Garašanin, *Germania*, 39, 1–2, 1961, forthcoming. For the Balkan-Anatolian complex, cf. 39 *B.R.G.K.*, 12 ff., and in greater detail, *Glasnik Zemaljskog muzeja*, IX, 5 ff.

[15] M. Garašanin, *Germania*, 39, 1–2.

[16] So in part with the sack of the Late Bronze Age settlements of Macedonia during the Aegean migration.

[17] Dealt with at length in *Germania*, 39—in the press.

[18] Cf. for this T. Passek, *Sovjetskaya archeologija*, 1958, 28 ff., especially 39 ff., figs. 5–6. These questions were discussed by T. Passek at the Neolithic Symposium in Prague in 1959.

[19] Summarized in M. Garašanin, 39 *B.R.G.K.*, 24, fig. 5, 4, note 122.

[20] Cf. *ibid.*, 53 ff., pl. 6, 2–3.

correlated with the beginning of Troy VI and the Middle Helladic culture.[21] Many authors have repeatedly called attention, on the ground of individual pottery styles and the Aegean type of the curved knife from Humska Čuka, to the fact that Bubanj-Hum I is to be correlated with Early Helladic III.[22] This chronology is now further confirmed by the publication of the new finds from Hagios Kosmas. As Mylonas showed, one of the characteristic forms of Hagios Kosmas, stage II, is the one-handled vessel, completely identical with the typical forms of the Baden group.[23] Now Mylonas could also show that Hagios Kosmas II corresponds to Early Helladic III and Troy IV–V.[24] Thus the equation Bubanj-Hum Ib = Troy I was proved to be impossible in practice. Let us leave aside the occurrence in Bubanj-Hum II of not only one isolated sherd of Minyan type, but also a number of pottery finds showing connexions in form and technique with the Minyan, although not with classical Minyan.[25] Let us also omit the fact that Bubanj-Hum III, with its two-handled vessels, beaded decoration, and accumulation of animal bones should be connected on the one hand with Glina-Schneckenberg and on the other with Usatovo.[26] We should, however, now stress especially that very much exists within the framework of the Slatina group which should be traced without hesitation back to connexions with Vattina.[27] The Vattina group, however, belongs at its beginning to the widespread complex of those groups which at the transition from Early to Middle Bronze Age (Reinecke A2–B1) embrace the whole region of the Lower Danube as far as present-day Czechoslovakia. The chronological relation of these groups to the Aegean is tied down by the decorative discs which have connexions with the Shaft Graves.[28] At the same time one must stress that this connexion with the Shaft Graves provides in the final resort only a *terminus post quem*, as a result of which every attempt to connect Slatina with the beginning of Troy VI becomes impossible. This leaves aside the fact that in Mellaart's view the development from Bubanj-Hum I to Slatina would comprise the time-span from Troy I to the Shaft Graves, which by his absolute dating must have occupied a space of more than 1500 years. It is a view to which no Central European scholar could submit.[29]

Let us now return again to the historical interpretation. In my opinion the development of the Baden, Vučedol, Coţofeni and other groups resulting from the breakdown of separate Neolithic entities, is to be traced back to a complex and at present still insufficiently intelligible process, which, however, lasted until the transition to Middle Helladic and Troy VI. I think it is beyond any doubt that at the same time separate movements, probably from the Russian steppe, played a prominent part, together with those elements which made important contributions to the Indo-Europeanization of the south-east.[30] The process suggested here must, however, certainly be dated *c.* 2000 B.C.

[21] ANTIQUITY, 1960, 273 ff. and chronological table.

[22] M. Garašanin, *op. cit.*, 60. D. Garašanin, *Archaeologia Iugoslavica*, I, 19 ff.

[23] G. Mylonas, *Hagios Kosmas*, 1959, type C13 (cf. catalogue, p. 189), fig. 141, no. 176; 142, no. 170, 171, 178; 143, no. 180; 147, no. 203; 149, no. 213; 151, no. 220–224; 152–153; 154, no. 245–246; 155, no. 251–255; table of types, fig. 57. Cf. also M. Garašanin, 39 *B.R.G.K.*, 44, note 240.

[24] Mylonas, *op. cit.*, 159 ff.

[25] M. Garašanin, *op. cit.*, 63, pl. 11, 4; 12, 1.

[26] *Ibid.*, 64 ff., pl. 13, 2–4; cf. also M. Garašanin, *Glasnik Zemaljskog muzeja*, XV–XVI, 1961, 19 f. In view of this the relationship of the two-handled vessels with Armenochori need not be disturbed, since, as is well known, this Macedonian group exhibits a retarded version of the Early Bronze Age. W. W. A. Heurtley, *Prehistoric Macedonia*, 1939, 85.

[27] M. Garašanin, *op. cit.*, 66 f.

[28] *Ibid.*, 75 ff. For the decorative discs see most recently, K. Tihelka, *Kommission für Äneolithikum und die ältere Bronzezeit*, Nitra, 1958, 77 ff., pl. viii, 2.

[29] Attention was also called to this by S. Piggott, ANTIQUITY, 1960, 293, note 43.

[30] Cf. M. Garašanin, *op. cit.*, 105 f.; *Glasnik Zemaljskog muzeja*, XV–XVI, 5 ff.

I do not intend here to go further into the problem of absolute chronology. Mellaart's dates rest mainly on the results of C14 investigations. Here it will only be stressed that the often bitter discussion over the importance of this method has always shown quite clearly what a very important thing it is to have a large number of samples and the most scrupulous accuracy in their collection.[31] Because of the lack of numerous trustworthy dates for individual groups, I think that we are still unjustified in giving up archaeologically valid synchronisms in favour of single C14 samples, thereby, for example, misplacing Cucuteni A or Gumelniţa from their beginning into the period of the Baden group.[32]

It is obvious that there are still many questions in Aegean and Anatolian research which are inadequately solved. The views expressed here will also perhaps undergo here and there certain corrections in detail. I thought, however, that it was profitable to make a contrast between the rather one-sided opinions advanced by Mellaart on the basis of his exceptionally important Anatolian research, and a view-point resting in its essentials on the new Balkan investigations.

[31] Cf. most recently, H. T. Waterbolk, ANTIQUITY, 1960, 14 ff., especially 16 ff., and the examination by J. Neustupny, *Pravek Československa*, 1960, 26 ff.
[32] Mellaart, *op. cit.*, chronological table, p. 277.

# Book Chronicle—*continued from p. 275.*

CZECHOSLOVAKIA. *By* E. and J. NEUSTUPNY. *pp.* 211, 40 *plates*, 54 *text-figures*. *London, Thames and Hudson*, 1961, 30*s*. Volume 22 in the 'Ancient Peoples and Places' Series.

CRETE IN COLOUR. *Text by* OLIVIER REVERDIN, *Preface by* N. PLATON, *Photographs by* RUDOLF HOEGLER, N. PLATON and N. CREUTZBERG. *pp.* 153, *including* 88 *colour photographs*, 4 *figures*. *London, Thames and Hudson*, 1961. £5 5*s*.

A HISTORY OF THE SUDAN TO 1821. *By* A. J. ARKELL. *pp.* 252, 24 *plates*, 27 *text-figures*, 11 *maps*. *London, the Athlone Press*, 1961. 30*s*. A second and revised edition of this valuable textbook first published in 1955.

THE MIDDLE KINGDOM IN EGYPT. *By* WILLIAM C. HAYES. *pp.* 86. *Cambridge, the University Press*, 1961. 10*s*. 6*d*. Fascicle 6 of the current revision of the Cambridge Ancient History (vols I and II), being the revision of Chapter XX of Volume I. The internal history of Egypt from the rise of the Heracleopolitans to the death of Ammenemes III.

GREEK SETTLEMENTS IN THE EASTERN AEGEAN AND ASIA MINOR. *By* J. M. COOK. *pp.* 33. *Cambridge, the University Press*, 1961. 6*s*. Fascicle 7 of the revised Cambridge Ancient History; being a revision of Volume II, Chapter XXXVIII.

MYCENAEANS AND MINOANS. *By* LEONARD R. PALMER. *pp.* 264, 44 *figures*, 16 *plates*. *London, Faber and Faber*, 1961. 30*s*. Professor Palmer subtitles his book 'Aegean Prehistory in the Light of the Linear B Tablets' and discusses, *inter alia*, aspects of the controversy about the dating of the tablets at Knossos. (See ANTIQUITY, 1961, 4, 135, 233, and 308.) No bibliography and no references.

THE ORIGINS OF GREEK CIVILIZATION. 1100–650 B.C. *By* CHESTER G. STARR. *pp.* 386, 2 *maps*, 24 *plates*. *New York, Knopf*, 1961. $8.50.

CHINA. *By* WILLIAM WATSON. *pp.* 214, 68 *text figures*, 48 *plates*. *London, Thames and Hudson*, 1961. 30*s*. Volume 23 in the 'Ancient Peoples and Places Series'. It is subtitled 'China Before the Han Dynasty'.

ASOKA AND THE DECLINE OF THE MAURYAS. *By* ROMILA THAPAR. *pp.* 283 4 *maps*, 6 *plates*. *London, Oxford University Press*, 1961. 45*s*.

ANTIQUITY XXXV, 1961

# The Progress of English Place-Name Studies since 1901

by BRUCE DICKINS

*In this article, Professor Bruce Dickins, Emeritus Professor of Anglo-Saxon in the University of Cambridge and sometime Director of the Survey, takes the opportunity of the publication of two general surveys of English Place-Names and of three volumes of the West Riding Survey, to discuss the development of English Place-Name Studies in the last sixty years. The books he here discusses are:—*

*THE ORIGIN OF ENGLISH PLACE-NAMES by P. H. Reaney. London, Routledge and Kegan Paul.* 1960 (*second impression* 1961). *pp. x* + 278. 32*s. net.*

*ENGLISH PLACE-NAMES. By Kenneth Cameron. London, Batsford.* 1961. *pp.* 256 *and* 8 *plates.* 30*s. net.*

*THE PLACE-NAMES OF THE WEST RIDING OF YORKSHIRE. By A. H. Smith. Parts I–III (English Place-Name Society, Vols. XXX–XXXII). Cambridge, University Press.* 1961. *pp. xii* + 346 + *map, pp. xii* + 322 + *map, pp. xiv* + 278 + *map.* 35*s. net per volume.*

THE diamond jubilee year of English place-name studies is 1961, and the appearance of two excellent books intended for the general reader gives one the opportunity of surveying the progress made in the last sixty years. The systematic study of English place-names on a county basis can be said to have begun with W. W. Skeat's *The Place-Names of Cambridgeshire*, a short monograph published for the Cambridge Antiquarian Society in 1901. Skeat produced further studies, on Huntingdonshire in 1902–1903 and on Hertfordshire in 1904, on Bedfordshire in 1906, on Berkshire in 1911 and on Suffolk which appeared in 1913, the year after his death; this last has not yet been replaced. His volumes, based for the most part on material already in print, dealt with few but major names and therefore failed to bring out the full significance of the toponymy; thus he considerably underrated the Scandinavian influence in Cambridgeshire. In the years before the foundation of the English Place-Name Society in 1923 several books appeared, some of which have not yet been replaced in part or in whole. Among these should be noted W. H. Duignan's on Staffordshire (1902), F. W. Moorman's on the whole of the West Riding (1910) and A. Goodall's on the south-west part of it (1913), W. St. C. Baddeley's on Gloucestershire (1913), W. J. Sedgefield's on Cumberland and Westmorland (1915), A. T. Bannister's on Herefordshire (1916), Allen Mawer's on Northumberland and Durham (1920), and E. W. Bowcock's on Shropshire (1923). During this period too a number of counties were studied by H. C. Wyld and his Liverpool pupils, Lancashire by Wyld and T. O. Hirst (1911), Nottinghamshire by H. Mutschmann (1913), Sussex by R. G. Roberts (1914) and Derbyshire by B. Walker (1914–1915). Wyld's attitude, adopted by his pupils,

is summed up in a couple of sentences from his preface (p. viii): 'Place names are here considered as elements of language, and their development as a purely linguistic problem. . . . Thus the work . . . is not concerned with the question whether the names fit the places to which they are attached, nor whether they ever did so'. This narrow concentration on one aspect can lead to strange results, as when Walker could only cite one form for Over and Nether Seal and that as part of a personal name. There are in fact plenty of early forms, but they must be sought in documents relating to the adjacent county of Leicester from which the parishes were transferred to Derbyshire only in 1897.

F. M. Stenton's short monograph (1911), 'an attempt to consider the local nomenclature of Berkshire as illustrating some aspects of early English history, in particular the growth of the village community and manor', and E. Ekwall's Lancashire (1922) pointed the way to a wider conception of the study. And here one must pay a tribute to the work done by Swedish scholars, chiefly by R. E. Zachrisson of Uppsala and E. Ekwall of Lund and their pupils, beginning with Zachrisson's *Anglo-Norman Influence on English Place-Names* (1909), which explains some apparent anomalies in linguistic development, as, for example, why the name of the Gloucestershire town became Cirencester (now too rarely pronounced in the traditional way as Sissiter), whereas, according to the rules of the game, both elements should have developed as in *Chich*ester. Several county volumes have been produced in Sweden, and of these J. K. Wallenberg's on Kent (rather tiresomely divided between two volumes with almost identical titles, 1931 and 1934), A. Fägersten's Dorset (1933) and H. Kökeritz's Isle of Wight (1940) have not been superseded. Also from Sweden have come useful books on different aspects of the study, of which Ekwall's contributions are outstanding. Apart from his volumes on Lancashire already mentioned and on the City of London (1954) the chief are his *Scandinavians and Celts in the North-West of England* (1918), *English Place-Names in -ing* (1923), *English River Names* (1928) and, most notable of all, *The Oxford Dictionary of English Place-Names*, first published in 1936 and revised in each successive edition, the latest of 1960. Ekwall's Celtic etymologies have not always been accepted by Celtic scholars, for example by Kenneth Jackson; and his interpretations of names sometimes fail to satisfy a reader who has intimate personal knowledge of the county from which they come. Yet, all in all, the *Dictionary* is a truly remarkable achievement for any scholar native or foreign, being particularly valuable for those counties on which no reliable volume has so far been published.[1] Ekwall has also been of great service to successive general editors of the English Place-Name Society, which was founded in 1923 by Allen Mawer and F. M. Stenton (both eventually knighted). Its volumes marked a definite advance in the study. From the start a much wider range of documents printed and unprinted were examined. The alphabetical arrangement, adopted by nearly all their predecessors but Skeat, was dropped in favour of the topographical, by hundreds (or wapentakes) and parishes. The historical and social as well as the linguistic implications of the material were brought out; on this last point the value of Stenton's introductions to many of Volumes II–XIX of the Society's publications and his six Presidential Addresses to the Royal Historical Society (1939–1943 and 1945) cannot be over-estimated. Now in 1961 the map (Fig. 1) shows better than a lengthy account what the Society has accomplished up to date and what remains to be done. The way in which it has been done has of course developed as time went on. The earliest volumes did not attempt to cover the field-names, which were first seriously tackled in Volume X (Northamptonshire) and then huddled together at the end after the place-names proper. Only from Volumes

[1] Since this article went to press a valuable review, by Professor Whitelock, of the 1960 edition has been published in *The English Historical Review*, LXXVI, 673–675.

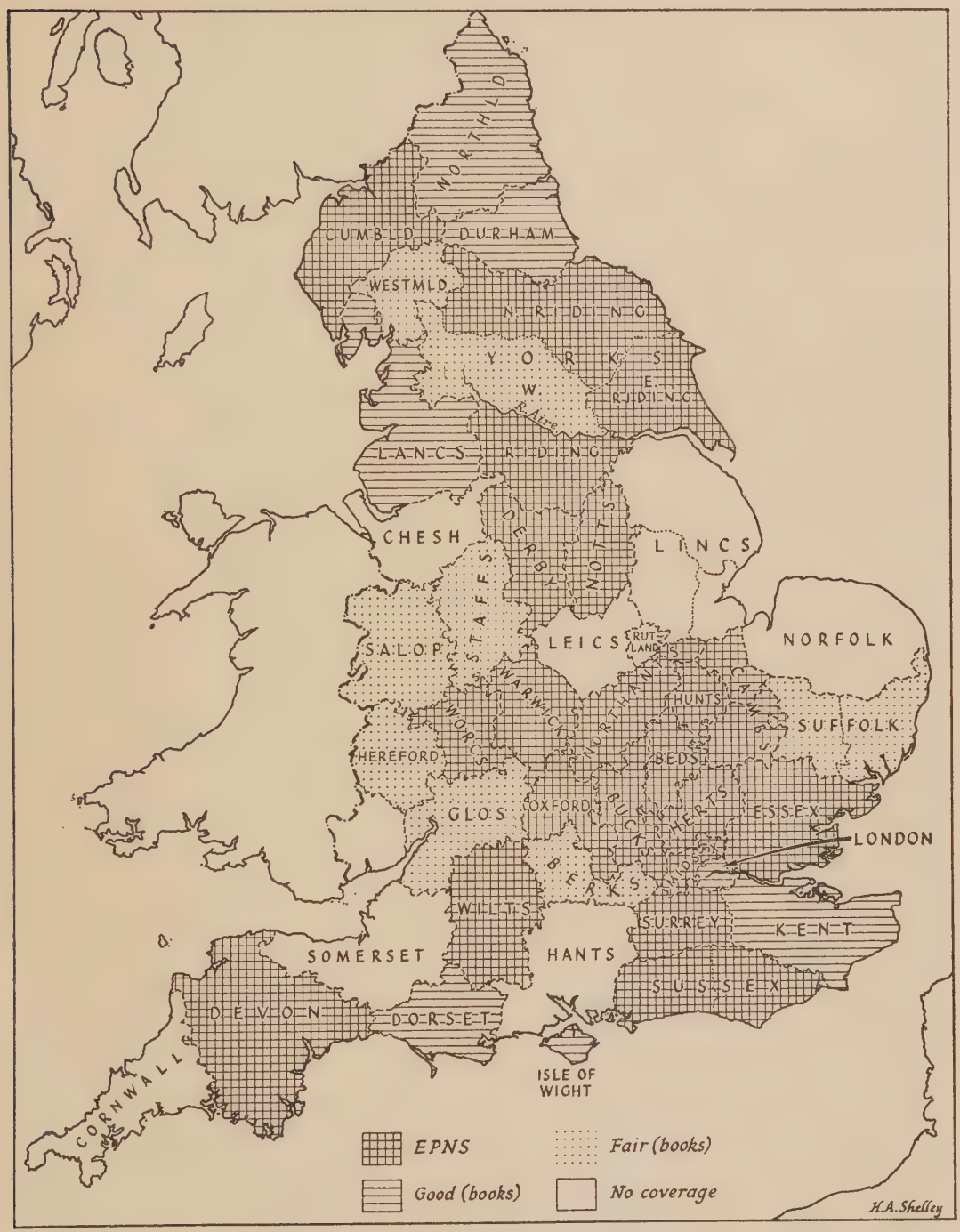



*Fig. 1. The present state of coverage in England.*

xx–xxii (Cumberland) have they been listed after the parishes to which they belong, and it has never been practicable to index more than a few of the most interesting. Oxfordshire (xxiii and xxiv) and Derbyshire (xxv–xxvii) are the latest counties to be completed, but the first three volumes of the West Riding have appeared this year and most of the rest is in proof. The West Riding will probably occupy eight volumes in all, which is not surprising if one remembers that it alone is much bigger even than Lincolnshire. Professor A. H. Smith, who is responsible for it both as author and general editor, is a West Riding man and a thoroughly experienced scholar who has already published the North Riding (v), the East Riding and York (xiv), and *English Place-Name Elements* (xxv and xxvi), which expanded almost tenfold the original thin volume of 1924. It is difficult to fault his work, and one may note that his treatment of a number of names improves on that of his forerunners, as in Letwell (i, 143), Ulley (i, 163), Greasbrough (i, 181), Attercliffe (i, 208), Brightside (i, 209), Balne (ii, 14), Darrington (ii, 63), Nostell (ii, 91), Sharlston (ii, 114), Meltham (ii, 282), Slaithwaite (ii, 307) and Liversedge (iii, 27). The area covered in these three volumes comprises the six wapentakes that lie roughly south of the River Aire, Lower Strafforth (the Doncaster district), Upper Strafforth (the Sheffield and Rotherham district), Staincross (the Barnsley district), Osgoldcross (the Pontefract and Goole district), Aggbrigg (the Huddersfield and Wakefield district) and Morley (the south Leeds, Bradford and Wakefield district). The place-names give a good, if scarcely favourable, picture of the area, even before it was industrialized. They suggest a bleak countryside with poor soil imperfectly drained and covered with coarse grass, brushwood, and heather, bracken or broom where it was not marshy; the elements *carr*, *flash*, *mar*, *mire*, *pog*, *snape* and *sugg* (connected with *soggy*) show only too clearly the prevalence of marsh, not only in the south-east of the Riding. There is some evidence for Roman remains, but chiefly along the arterial roads. *Danum*, originally a river-name, and *Legeolium* are certainly to be identified with Doncaster and Castleford, both on Ermine Street; near Dewsbury rather than at Slack (ii, 303) is the probable site of *Cambodunum* on the road from *Calcaria* (Tadcaster) to *Mamucium* (Manchester); and Dhoul's (The Devil's) Pavement is part of the Roman road over Blackstone Edge (iii, 63). Few of the names suggest early Anglian settlement, and Scandinavian influence, appreciable in the south-east, is less and less in evidence as we go west. There are many names on which it is tempting to linger, and Pontefract demands a sentence or two. Its Anglian name *Taddenesscylf* (preserved in Tanshelf nearby) and its Scandinavian name *Kirkeby* gave way to the Anglo-Norman *Puntfreit*, latinized as *Pons Fractus*, and the accusative of the Latin has come down to us as Pontefract; the earlier form *Pomfret* will soon, it is to be feared, survive only in the name of a (to me) repulsive sweet made from liquorice grown at Pontefract since 1713 at latest. Pontefract was a prosperous little borough; as one can tell from the early street-names, a variety of craftsmen plied their mysteries there, and it had the usual amenities, a cattlemarket, a horsemarket, a pigmarket and a sheepmarket, a moot hall, a prison and a gallows hill. Osgoldcross, *alias* Pontefract Market Cross, was the meeting-place of the wapentake (ii, 79); this identification had not been made by O. S. Anderson (now Arngart) in his valuable *The English Hundred-Names* (1934–1939).

The English Place-Name Society does not intend to reprint the *Introduction* which appeared as the first part of Volume i in 1924, so that the publication of these two books by Drs Reaney and Cameron is particularly welcome. They too are experienced place-name scholars of good judgement, for Reaney was responsible for Essex (xii) and Cambridgeshire (xix) and Cameron for Derbyshire (xxvii–xxix). It is difficult to make a choice between two such good books issued at much the same time, and at almost the same price. If one must be chosen Cameron's might be given the preference. It has some useful illustrations, is

two shillings cheaper, and makes slightly more concessions to the reader who is not a specialist. Many of the chapter headings are much the same in both books, but Cameron has sub-divided his more closely, with chapters, for example on Place-Names and Archaeology, on Place-Names with Pagan, Mythological and Popular Associations, on Place-Names with Christian Associations, on Place-Names Illustrating Social and Legal Customs, and on Roads and Ways. These should be of special interest to the archaeologist and the historian. Thus *borough/burgh/burrow/bury*, may refer to a Neolithic long barrow (as in Ashbury, Berks.), or to a Bronze Age sanctuary (as in Avebury, Wilts.), or to a Roman station (as in Brough-on-Humber, the *Petuaria* of the Antonine Itinerary), or to the stronghold of an early Saxon chief (as in Cadbury, Somerset), or a 9th- or 10th-century fortification against the Danes, as is probably the case in Hertingfordbury, Herts. *Caster/chester/cester*, usually denotes a Roman fort or settlement (as in Tadcaster, Dorchester and Leicester), of which there are sometimes no visable remains. The occurrence of *street* in early documents may sometimes point to a minor Roman (or earlier) road, the existence of which had been completely forgotten. Stonehenge (Wilts.) derives its name from the famous circle of standing stones once capped by lintels; Featherstone (WRY) and Shilstone (Devon) from megaliths, the first gone but the second still known as the Spinster's Rock. Again, the English *low* and the Scandinavian *how* generally refer to a burial mound of earth which may originally have been heaped up at almost any period, not necessarily that in which the person whose name it bears was buried. But it is reasonable to conjecture that Taplow (Bucks.) preserves the name of the Tæppa whose splendid grave-goods in the British Museum are only surpassed by those from Sutton Hoo, and the lost *Grimeshou* is probably the burial mound of the Scandinavian who gave his name to Grimesthorpe (WRY, i, 210). This last example shows that it is profitable to look through the minor names in a volume published by the English Place-Name Society.

The historian too has much to learn from place-name studies, on the date and extension of the Anglo-Saxon settlement from the distribution of archaic words and names as of the elements *-ingas* and *-ingaham*, and of the traces of the cult of the heathen gods *Woden* (as in Wednesbury and Wednesfield, Staffs.), *Thunor* (only in the Saxon area and not beyond the Home Counties) and *Tiw/Tig* (as in Tysoe, Warwickshire). Again, in the second volume of Charles Plummer's edition of the Anglo-Saxon Chronicle (1899) a number of place-names were identified wrongly or not at all. Now a glance at the footnotes to G. N. Garmonsway's translation (1953) will show how many of the current identifications are due to place-name scholars, e.g. under E 675 (the Shropshire estates of Peterborough Abbey), E 686 (Avery, Kent), 833 and 840 (Carhampton, Somerset), A 906 (Tiddingford, Bucks), C 1016 (Clay Hill in Tottenham, Middlesex), E 1114 (Westbourne, Sussex), H 1114 (Kingsthorpe, Northampton) and E 1121 (Brampton, Hunts.).

I fear that little has been said here of Reaney's book, but he has had plenty of well-deserved praise from other reviewers and, what is more, the satisfaction of seeing a second impression called for almost at once. For the further editions that are sure to be needed here are a couple of corrections, Bromkinsthorpe for Bromskinthorpe at p. 173 and Thurstaston for Thursaston at pp. 42, 49 and 58. It may be further suggested that the name of a specific fish as the first element of a stream- or pool-name is not quite so rarely found as Reaney states at p. 152; see *blæge* 'gudgeon', *leax* 'salmon', *pinc* 'minnow' and *sc(e)ota* 'trout' in *English Place-Name Elements*. Oddly enough neither Reaney nor Cameron makes use for comparative purposes of the material in B. C. Charles's *Non-Celtic Place-Names in Wales* (1938) nor lists it in his otherwise excellent bibliography. Yet the English names in Little England beyond Wales (West Pembrokeshire) are of particular interest since none of them can have arisen before *c.* 1107.

ANTIQUITY XXXV, 1961

# Radiocarbon Dates and New World Chronology

by GEOFFREY BUSHNELL

*It is a commonplace of current archaeology that the publication of radiocarbon dates is revolutionizing our ideas of the past. Dr G. H. S. Bushnell, Curator of the Museum of Archaeology and Ethnology in the University of Cambridge, England, has already published in* ANTIQUITY *and elsewhere some of his views on the impact of radiocarbon dating on New World chronology. Here he studies the whole problem in detail. He adopts the useful convention of referring to a date already fully published in the Radiocarbon Supplement to the* American Journal of Science *simply by its laboratory designation and number (thus K-554 is reading no. 554 of the Copenhagen Laboratory), but in some cases, where the date is not fully published, he gives fuller information.*

IT is hard to realize that it is only twelve years since Dr Libby announced the first radiocarbon dates. The occasion was one which no one who was present is likely to forget, a crowded session of the XXIX International of Americanists in the American Museum of Natural History in New York in 1949, at which he outlined the method and gave us one date for the Old World and one for the New. The possibility of an independent method of dating had raised high hopes among archaeologists, and none higher than among those in Libby's audience whose particular interest lay in America. The reason for this was not far to seek; in the Old World there were many aids to dating, but in the New these were either absent or, for various reasons, of little help. Varve counting and pollen analysis had not been sufficiently developed there by 1949, dendrochronology had given an exact dating sequence back to the first century A.D. in the south-west of the United States but was of little value elsewhere owing to lack of suitable material; dated objects like coins were absent, correlation of the Maya calendar with our own was still uncertain, records written in non-alphabetical scripts of various kinds existed in Mexico but were of little use for dating, and any sort of recognizable writing was absent from the other centre of high civilization in Peru. Since 1949 the radiocarbon method has been shown to be sound, if properly used, its accuracy has been improved by the introduction of gas-counting, refinements in the determination of the half life of C14 and other factors, and its backward range has been extended from about 10,000 years to a figure of the order of 50,000 years, which is more than enough to cover man's occupation of America.

One of the chief problems in American archaeology is the date of man's first arrival there. It is well known that he arrived from Asia at a late stage in his development, when all varieties other than *Homo sapiens* had long been extinct. He must have walked across a dry Bering Strait before boats were invented, at some time when sea level had been lowered over 150 ft. by the incorporation of vast volumes of water in the Quaternary ice sheets. One service which radiocarbon dating has rendered is to indicate that the last time there

was such a land bridge was from about 23,000 B.C. to between 9000 and 8000 B.C.[1] The method has also enabled us to date the climatic changes of late glacial and early post-glacial times in North America, and indeed to correlate them with those of northern Europe. An important milestone in these changes is the Two Creeks Interstadial, which has been firmly dated by many measurements at 9500 to 9000 B.C., and corresponds with the Allerød of northern Europe. Numerous sites in the United States and two in Mexico, where early hunting peoples butchered mammoth and extinct species of bison, have been dated between the end of this period and about 5000 B.C., by which time most of the large Pleistocene mammals were extinct.[2] Camping places are also known, but are rare. The best known of these sites belong to the Folsom Complex, well-known for its fluted stone points, and the Cody Complex, whose most characteristic artifacts are two types of stemmed point and a triangular knife. The earliest dated site of this series is a Folsom one at Lindenmeier, Colorado, about 8800 B.C.[3] Geological evidence has shown that other mammoth kills, associated with a less developed form of fluted point, called Clovis, were older than Folsom, but it is only comparatively recently that carbon dates[4] for the Lehner site, Arizona, have indicated a probable date of rather before 9000 B.C., which would place this site at least within the Two-Creeks Interstadial.

These are the occurrences for which there is firm evidence, but there are earlier ones which are doubtful for one reason or another. One such instance, some burnt bones of dwarf mammoth from Santa Rosa Island off the Californian coast, has been dated at nearly 30,000 years, and another, some charcoal claimed to be of human origin at Tule Springs, Nevada, has given an age of more than 23,000 years. Further evidence is required before these and other instances of comparable age are generally accepted, and the chief requirement is the finding of artifacts of unquestionably human origin in association with them.

Once the hunters had reached North America they began to move southwards, either in pursuit of their quarry or under pressure from later arrivals, and we owe to radiocarbon dating the knowledge that between 9000 and 8000 B.C. they had reached the southern shores of Patagonia.[5] This is supported by a date of about 6000 B.C. for a site belonging to hunters and gatherers in a cave at Intihuasi, San Luis Province, Argentina.[6]

It used to be thought that the big game hunters of North America gave place, about 5000 B.C., to various peoples of what is called the Archaic Stage, who lived chiefly by food gathering—the collection of wild seeds, berries, roots or shell fish—supplemented by the hunting of small animals and birds, but we are now beginning to learn, again with the help of radiocarbon dates, that this is not a true picture and that the food gatherers were active and widespread in the United States far earlier than we thought. People were living

[1] D. M. Hopkins, 'Cenozoic History of the Bering Land Bridge', *Science*, vol. 129, no. 3362, p. 1519, 5 June, 1959.

[2] The radiocarbon dating evidence for the extinction of the Pleistocene fauna has been treated at length in a recent article, 'Pleistocene Extinction and Radiocarbon Dating', by J. J. Hester, in *American Antiquity*, vol. 26, no. 1, 1960. His chief conclusion is that the majority of the large Pleistocene animals living in herds, viz. Columbian mammoth, horse, camel, some species of bison, and dire wolf, became extinct about 6000 B.C. This does not exclude the possibility that some survived later in isolated pockets, and there is some evidence that mastodon and some ancient species of bison did so.

[3] Sample L.24a from Lindemeier, measured by Isotopes Incorporated (10,780 ± 375 years). See 'Geological Significance of a New Radiocarbon Date from the Lindenmeier Site', by V. Haynes and G. Agogino, *Proc. Denver Museum of Natural History, Denver, Colorado*, no. 9, August, 1960.

[4] K-554, M-811.

[5] W-915. This date, which was published while this article was in the press, points to an earlier date for man's first arrival.

[6] Y-228.

in this way in places as far apart as Danger Cave in Utah (possibly before 8000 B.C.),[7] Graham Cave in Missouri (between 8000 and 7000 B.C.),[8] and the Modoc Rock Shelter in Illinois (about 8000 B.C.),[9] and yet others were exploiting the salmon run on the Columbia River at The Dalles, Oregon (about 7000 B.C.).[10] It still appears that the big game hunters arrived first, since no instances of the food-gathering way of life have yet been proved to occur before about 8000 B.C., but both were present in considerable numbers between 8000 and 5000 B.C. All this points to the existence of a far more complex situation at this early date than we used to think; instead of a few wandering bands of hunters there were people living in a variety of ways, very likely the result of several migrations from different parts of north-east Asia.

The time and place of the beginning of the cultivation of a plant are, in the nature of things, difficult to determine, but a beginning has been made with the aid of radiocarbon dates. It is too soon to go into this in any detail because only a summary of the latest information has been published, but it is becoming clear that the beginnings of cultivation preceded the establishment of settled villages with full dependence on agriculture by a long time, perhaps millennia, and evidence is accumulating that the cultivation of different plants may have begun in different parts of tropical America, a good many of them in some part of Mexico. In view of its importance, it is not surprising that a good deal of attention has been paid to maize, and Dr R. S. MacNeish has shown that it was being grown on a small scale in the State of Tamaulipas in north-east Mexico before 2500 B.C.,[11] and it has been estimated that it began there about 3000 B.C. It may have been grown even earlier, about 3500 B.C., in Chiapas, but the exact date has not yet been published. Earlier occurrences may yet be discovered, in Mexico or elsewhere, but it was not until about the middle of the second millennium B.C. that there is evidence from the Valley of Mexico that cultivated plants produced a large enough proportion of the total food supply to have any great effect on man's way of life.

There are few parts of America where radiocarbon dates have not been of service in building up our present knowledge, but naturally the effects have been most important in the places where the highest civilizations developed, namely Peru, Mexico and some adjacent lands. Considering Peru first, in 1949 a few middens accumulated by preceramic people had recently been discovered on the coast. These people lived largely on fish, shell-fish and sea mammals, supplementing their diet by collecting wild plant products and cultivating a few plants like beans, squash and peppers. They also grew cotton, but they had no maize, the staple food of their pottery-making successors. They were the earliest people known there, and the only clue to their date was an estimate based largely on the rate of accumulation of sediments, which involved some rather large assumptions. This suggested that they had arrived about 3000 B.C., which has proved rather too early although it is surprisingly near the proper figure. Dr Junius Bird had excavated one of these middens, the Huaca Prieta in the Chicama Valley, and with great foresight had collected a series of samples for radiocarbon dating before the first dates had been announced. These extended through the whole 40 ft. of the deposit, and the consistency of the results, which showed that the midden was accumulating from about 2300 B.C. to 1200 B.C.,[12] gave one of the earliest and best demonstrations of the value of the method,

[7] M-204.
[8] M-130.
[9] C-907,908.
[10] Y-340.
[11] C-687.
[12] C-313, 316, 318b, 321, 362, 598.

besides providing a starting point for the succession of Peruvian cultures which ended with the expansion of the Incas in the middle of the 15th century. Since the publication of these results, many more deposits of the same age have been found in other parts of the Peruvian coast, and the age of the culture has been confirmed by readings from various laboratories.[13] A cemetery has recently been found belonging to an earlier stage, in which the people lacked cultivated plants and buried their dead in vicuña skins and twined rush mats. This has been dated to about 3000 B.C.[14]

The next great landmark in Peruvian prehistory was the arrival of some new people, probably from Mexico, who brought with them the worship of a cat god, very likely the jaguar, for whom they built important temples. It was a date of about 700 B.C., shortly after their arrival, which we heard Libby announce in 1949.[15] For many years something has been known of the sequence of events after this, largely owing to the abundance of later Peruvian material in our museums. The finely modelled pottery of the Mochica state on the north coast, the richly painted pottery of Nazca on the south coast, the beautiful textiles, and the work in gold, silver and copper, are particularly familiar. Curiously enough, the exact dating of this part of the succession has lagged behind that of the earlier part, and there have been considerable differences of opinion among archaeologists about how the various cultures must be spaced out within the known limits. Only in the last few years have we obtained a reliable series of dates going up to about A.D. 580 on the south coast,[16] and to A.D. 500 in the south highlands.[17] The situation for the north coast, one of the most important areas, is not so satisfactory, but two readings of about A.D. 650 for the end of the Classic Period there[18] tend to confirm the accepted correlations between north and south coastal areas. Many other gaps remain to be filled, and in particular we need to know the dates of the events of the last 600 years before the Inca conquest in the 15th century.

Just north of Peru lies Ecuador, with a succession of cultures whose affinities with the north are, on the whole, much closer than with Peru. I will content myself with mentioning the difficult question of the dating of the earliest ceramic horizon, called Valdivia. This depends on three dates obtained from marine shells, ranging from 2500 to 2100 B.C.,[19] nearly 1000 years before the earliest pottery in Peru, and several centuries before the oldest known pottery anywhere else in America, with the possible exception of Monagrillo in Panama which has yielded a single date of about 2100 B.C.[20] If these dates are correct they will have far-reaching implications, because the Valdivia pottery is quite elaborate and does not look like the work of people who have just developed the craft. A suggestion has recently been made that knowledge of the craft was brought by sea from Japan, on the ground that Valdivia shares many traits with Jomon pottery, and some such explanation may indeed be necessary.[21] In any case it reinforces the urgent need for an independent check on these dates, because shell dates have sometimes proved too old.

[13] For the bottom of the deposit at the Huaca Prieta, the Lamont Laboratory (Columbia University) has two dates, L-116,A,B. To these and some other older readings, 200 years have to be added for the Suess effect. Deposits in other parts of the coast have produced six readings from the New Zealand Laboratory, not yet fully published, between 1850 and 1300 B.C. See F. Engel, *Algunos datos con referencia á los sitios precerámicos de la Costa Peruana*, Lima, 1958.

[14] New Zealand Laboratory; 5020 years. See F. Engel, 'Un groupe humain datant de 5000 ans a Paracas, Pérou, *Journ. de la Société des Americanistes, Paris*, N.S., vol. xlix, 1960.

[15] C-75.

[16] From the Lamont laboratory. The latest in date is L-268E.

[17] From the Pennsylvania laboratory. The latest in date is P-121, 121A, 122.

[18] L-335A,B.

[19] W-631, 632, 630.

[20] Y-585.

[21] See E. Estrada, *Nuevos Elementos en la Cultura Valdivia*, Guayaquil, Ecuador, 1961.

Mexico presents a kaleidoscopic variety of ancient peoples, but it can be reduced to some kind of order by using the highland Valley of Mexico, where the capital now lies, as a yardstick. Here a continuous succession has been worked out, starting with farming villages, which were later brought under the rule of a theocracy based on an imposing ceremonial centre, with great stone pyramids and temples, at Teotihuacan. In its turn, this gave place to the warlike state of the Toltecs, followed by those of the Aztecs and the related tribes. Radiocarbon dates have shown that the farmers were settled by about 1500 B.C.,[22] and that the ceremonial centre of Teotihuacan began to arise in the early centuries A.D.[23] For later dates in the Valley of Mexico, we are dependent on estimates based on a variety of sources, some of them contradictory, and further radiocarbon dates would be very useful in checking them. Ceremonial centres like Teotihuacan are found elsewhere in Mexico, and there is a notable example at Monte Alban in Oaxaca. Cross-dating by means of objects from one centre found at the other had indicated that these two were flourishing at much the same time, and the few radiocarbon dates we have confirm this, though it appears that Monte Alban started to develop some centuries earlier than Teotihuacan.[24] It has been shown recently that a remarkable ceremonial centre at La Venta in the lowlands of Tabasco can be dated between about 800 and 400 B.C.,[25] a good deal earlier than had been expected, showing that a hierarchical form of society flourished and disappeared in the lowlands before it had really developed in the highlands.

The latest and most important service which radiocarbon dating has rendered to American archaeology is in this region, where it has put the correlation of the Maya and the Christian calendars on a firm basis. The ancient Maya of south-east Mexico and the adjacent countries, where their descendants still live, attached great importance to their calendar, which was expressed in a very elaborate series of hieroglyphs. Between about A.D. 300 and 900 they erected numerous stone monuments bearing dates written in these glyphs, in a system which did not allow a date to recur until over 374,000 years had elapsed, but after that they simplified their calendar very greatly and dates came to be written in a way which would repeat every 256 years. Dates common to the Maya and the Christian calendars in the 16th century have been recorded, but it has hitherto been uncertain which 256-year Maya cycle they belong to. A correct correlation was vital to archaeologists since it would enable the Maya monuments and the great ceremonial centres where they are found to be firmly dated, and by means of cross-dating this knowledge could be extended to a far wider area, including Oaxaca and the Valley of Mexico which I have mentioned already. For some years there has been a lively controversy between the proponents of various correlations, especially the Goodman-Martinez-Thompson correlation, and the Spinden one which would make all the dated monuments 256 years older. The first, generally known as the Thompson correlation, has been accepted by most archaeologists for some years, but the first few carbon dates to be measured, using beams from dated temples, appeared to favour the Spinden correlation, although it was realized that differentiation between 256-year cycles would need the utmost refinement of which the method was capable. Recently two long series of dates, ten for one and six for the other, were measured from two temples bearing Maya dedicatory dates at Tikal in Guatemala,[26] using the most stringent precautions,

[22] C-199.

[23] Y-644.

[24] The second stage there has been dated about 300 B.C. (C-425), and an equivalent to the first stage at a neighbouring site about 600 B.C. (C-424).

[25] M-528 to 536. See Drucker, Heizer and Squier, 'Excavations at La Venta, Tabasco, 1955', *Bulletin* 170, Smithsonian Institution, Bureau of American Ethnology, Washington, 1959.

[26] P-230, 232, 234 to 238, 242 to 245, 247, to 249, 251. See Satterthwaite and Ralph, 'New Radiocarbon Dates and the Maya Correlation Problem', *American Antiquity*, vol. 26, no. 2, October, 1960.

and when these were announced at the 25th Anniversary Meeting of the Society for American Archaeology, which I attended in May, 1960, they were acclaimed as a triumphant vindication of the Thompson correlation. Those of us who had heard Libby announce the first dates nearly eleven years before felt that this was a worthy sequel. The few discordant dates, which had been published previously, proved to be due to taking samples from part of a beam cut from the heart of an old tree, or from an old beam reused; in measuring dates thousands of years old the resultant errors would not matter very much, but they could easily cause mistakes of the order of 250 years. This is a reminder that a single date or a few scattered ones carry little confidence in a controversial problem of this kind. What is needed is a consistent series of measurements, and if these are checked by more than one laboratory so much the better.

I have only been able to touch on some of the more important achievements of radiocarbon dating in America. There are many other cases, in the extreme north, the United States, Venezuela and elsewhere, in which some of our estimates have been confirmed and some corrected, and in some cases fresh problems have been raised. The value of the method has been amply demonstrated, and it is reasonable to expect much further help from it in the years to come.


# COWA SURVEYS AND BIBLIOGRAPHIES

THE COUNCIL FOR OLD WORLD ARCHAEOLOGY (COWA) is now publishing Series II of *COWA Surveys and Bibliographies*. This comprises 22 area reports on Old World archaeology from the Palaeolithic to late historic times. Each report consists of a survey of recent archaeological activities in the area and an annotated bibliography. A complete series contains over 200,000 words of survey material and over 4,000 annotated bibliographic items prepared by a distinguished corps of area editors with the aid of about 150 correspondents.

Annual subscription price of $7.50 pays for 11 areas (one-half of a series), mailed out several areas at a time as they are published. Single area: $1.00. Series I, 1958 and 1959, remains $4.00 for each year. For the complete Series II, subscriptions must begin with 1960.

Series I *COWA Surveys and Bibliographies for*

*1958:* British Isles, Central Europe, Eastern Mediterranean, European Russia, Northwest Africa, West Africa, Western Asia, Southern Asia, Northern Asia, Indonesia, Pacific Islands.

*1959:* Scandinavia, Western Europe, Western Mediterranean, Balkans, Northeast Africa, Equatorial Africa, South Africa, East Africa, Far East, Southeast Asia, Australia.

Series II *COWA Surveys and Bibliographies for*

*1960:* Same as 1958.

*1961:* Same as 1959.

*Council for Old World Archaeology*

11 Divinity Avenue, Cambridge 38, Mass., U.S.A.

ANTIQUITY XXXV, 1961

# Neolithic Engineering

By R. J. C. ATKINSON

*At the request of the Cambridge Committee for the History and Philosophy of Science, Professor Atkinson, now Professor of Archaeology in University College, Cardiff, gave a public lecture on Neolithic Engineering, and subsequently agreed to allow its publication in* ANTIQUITY. *This article is a condensation of his lecture, given in 1958, with subsequent additions.*

IN histories of technology the subject of early engineering is usually discussed mainly with reference to the achievements of the literate civilizations of the Ancient East. The contemporary or even earlier feats of our own more barbarous ancestors in the west, in their way no less remarkable, have been passed over largely in silence, or at best with a brief reference to Stonehenge.

There are, of course, good reasons for this disparity of treatment. From the ancient east we have a body of reliable evidence for engineering processes, in the form of carved reliefs and tomb-paintings; whereas in Europe we are compelled to infer the processes from their end-products. The reliability of such inference is not increased by the virtual absence of surviving specimens of tools and equipment made from perishable organic materials, and particularly from timber. Moreover, it is obvious that some engineering operations, such as the movement of heavy stones, will leave few traces for the archaeologist to identify and interpret.

Any discussion of Neolithic engineering must thus confine itself more to problems than to their solution. None the less, it is perhaps worth while to pay some attention to the technological aspects of such products of Neolithic engineering as flint-mines, earthworks and megalithic structures. We are inclined perhaps too much to regard these monuments merely as cultural indicators, or as components in some hypothetical scheme of morphological development, and to forget that they are also the products of skills which, as the restorers of Stonehenge well know, we should find it difficult to emulate even with our own vastly greater resources. Moreover, it is in the last resort only these monuments which provide us with positive evidence for the existence of social aggregates larger than the individual family, acting in concert for a common purpose.

It is essential to realise from the start that for all the operations of early engineering the only source of power was human muscle. The use of animals can be ruled out. The horse became an efficient means of heavy traction only with the invention of the horse-collar in early medieval times. Oxen, though certainly available, are slow, deliberate and ruminative in a metaphorical as well as a literal sense; and their reactions to words of command, or even to more painful stimulation, are notoriously sluggish, so that for any operation which required precise timing and strict control they would be inferior to man-power, in spite

of their greater strength. The basic problem of the Neolithic engineer was thus to find devices by which human muscle-power could be transmitted, by which loss of power in friction could be reduced, and by which the rate at which work was done could be adapted to the most efficient rate at which human muscles can expend their energy.

In the first category, the transmission of power, we have chiefly to consider ropes. Apart from finds in the lakeside settlements of the Alpine region of Europe, few actual Neolithic ropes survive, though the existence of suitable rope-yarns is amply attested by cord-impressions on pottery. The raw materials are likely to have been either leather, animal hair, or vegetable fibres such as flax, nettle or bast (the inner bark of certain trees, usually lime or willow).

Leather and animal hair are still used today for the transmission of power, in the form of industrial belting. Both have an ultimate *breaking* strength of about 4000 lb. per sq. in. A safe *working* load for a 3-in. (circumference) rope of these materials would be around 180 lb., or about one-quarter of that for a standard quality modern Manila rope of the same size. Since a rope of more than 6 in. in circumference is difficult to grip, it follows that the largest Neolithic ropes would have a working strength of about one-third of a ton, and that where heavy stones had to be moved, weighing up to several dozens of tons, the number of ropes required would be correspondingly large.

In the second category come devices for the reduction of friction, chiefly in the moving of heavy stones. Undoubtedly the most efficient method of transport is by water, as was sufficiently demonstrated by the now-vanished spectacle of a single horse towing a loaded coal barge along a canal; and this remains true today, if one neglects the time factor. The decline of our inland waterways is due not least to the fact that speeds on canals have to be kept low to prevent erosion of their banks. Where time is relatively unimportant, as it was in prehistory, a slow rate of progress is a positive advantage, because the drag on the hull of a vessel rises exponentially with its speed.

Even where it was possible, as it may have been in the transport of the Stonehenge bluestones from Pembrokeshire, to use a water route for 90 per cent of the journey, the problem of moving heavy masses on land still remained. As Heyerdahl's experiment with one of the Easter Island statues has shown,[1] it is *possible* to drag a 12-ton stone directly over the ground; but it is also very wasteful of manpower. By mounting the stone on a timber sled, and hauling the sled on a track of rollers, the tractive effort required can be reduced to about 100 lb. per ton on level ground. If we assume that a man can keep up a pull of 50 lb. on a rope throughout a working day, it follows that the *minimum* hauling party required to move a heavy stone is two men per ton.

In the third category we have to consider simple forms of machine, giving some mechanical advantage,[2] whereby the limitations of human strength directly exerted can be circumvented. The range of such machines available in Neolithic times is exceedingly small, since most of the basic forms incorporate principles of much later invention, such as the screw and the differential pulley.

The simple lever was undoubtedly used for the raising of heavy stones, and for moving them laterally when recumbent, by alternately lifting each end and swinging it sideways a few inches at a time. By way of example, the largest stone at Stonehenge, which is 30 ft.

[1] Thor Heyerdahl, *Aku Aku*, London, 1958, 150–151.

[2] That is, broadly speaking, 'leverage'. A rigid lever on which the load rests at 1·5 ft. from the fulcrum on one side, and the effort is exerted at 15 ft. from the fulcrum on the other, gives a mechanical advantage of 10 (i.e. 15 ÷ 1·5), and allows the lifting of, say, 500 lb. by an effort of 50 lb. To counterbalance this gain, of course, the effort must be exerted through ten times the distance that the load is lifted.

long and weighs 50 tons, could be raised at one end with three levers, each giving a mechanical advantage of ten, and each manned by eighteen men.[3]

For straight pulls on ropes it is conceivable, though extremely unlikely, that some kind of capstan or windlass was used. Of the two the capstan allows the greater mechanical advantage, since the length of the capstan-bars is limited only by the strength of their material. But both these machines require strong and well-turned bearings which could not be made without the use of a lathe, and would in any case be unable to withstand the stresses involved, if built wholly of timber.

The employment of the so-called Spanish Windlass, however, is a good deal more probable. In this very simple but effective device, a skein of ropes or cords is anchored firmly at one end, and attached at the other to the load to be moved. A lever (or two levers at right-angles in the form of a cross) is then inserted transversely at the centre of the skein, and rotated in order to twist up the skein and convert the rotary torque into a longitudinal tension. This is the means still adopted for tensioning the blade of a carpenter's bow-saw; and it was certainly used to brace together the bow and stern of papyrus-reed boats on the Nile in the third millennium B.C.[4] In any case, so simple a device could easily have been invented by any one fiddling idly with a stick and a loop of string. The mechanical advantage obtainable depends, of course, on the length of the levers used; while the pull developed, and the distance through which it can be exerted, is a function of the cross-section and the length of the skein of ropes.

These, then, are the principal devices available to the Neolithic engineer. The three main fields of activity in which they were applied are mining, the building of earthworks and the erection of megalithic structures.

Mining, apart from the unique workings for metamorphic rock at the stone axe factory on Mynydd Rhiw, Caernarvonshire[5] appears to have been confined to the exploitation of seams of flint stratified in chalk. The typical flint-mining area, with its multiplicity of filled shafts encircled by annular spoil-heaps, resembling nothing so much as an abandoned bombing-range, at first sight gives an impression of great activity combined with an incredible wastefulness of effort. The individual shafts, averaging 20 ft. in diameter, are usually very close to each other, and in many cases are simply shafts, with no galleries radiating from their bases to follow the seams of flint. Moreover, even where galleries do exist, their length is short, and small compared with the depth of the shafts.

It must be remembered, however, that in modern mining, particularly for coal, there is a critical depth, above which the difficulties of underground excavation and transport, and the instability of rock strata near the surface, make it more economic to adopt opencast methods of working. It seems likely that in Neolithic mining also there was an empirical recognition of a corresponding critical depth (which appears to be of the order of 15 ft.). Above that depth it would be cheaper, in terms of foot-pounds of work per pound of flint extracted, to sink a fresh shaft alongside than it would be to tunnel from the base of an existing shaft, since tunelling in a confined space must always be more difficult (and in the absence of timbering, more dangerous) than removing an even larger volume of material from a vertical shaft of larger cross-section open to the sky.

The tools used—antler picks, bone wedges and occasionally stone axes—are well known

[3] The maximum downward pull or push that a man can exert on a lever is of course equal to his own weight, or say 150 lb. But with his feet off the ground he can exert no control. I therefore assume here a maximum effort of 100 lb. per man.

[4] Singer, Holmyard and Hall, ed., *A History of Technology*, I, 1954, 735, fig. 535.

[5] *Proc. Prehist. Soc.*, 1959, 280; *ibid.*, 1960, 349.

and require no further discussion. What we do not know is the method used to transport the spoil to the surface. It has been suggested that it was carried in baskets on mens' backs (like those still used in Ireland for turf) by way of ladders made of notched tree-trunks. The principal argument for ladders relies on the presence in the galleries of the skeletons of voles, the marks of those teeth have been found on discarded antler picks. The voles must have reached the bottom alive and, it is claimed, by ladders, since the fall from the top would have killed them. But in fact these small rodents are a great deal more resilient than this. I have myself rescued them, alive and biting, from the dry bottom of a Romano-British well far deeper than any known flint mine. It is probable, of course, that ladders were used by the miners for access in any case; but their use also for the removal of the spoil would have been very inefficient, since the carriers would have to raise their own weight as well as their load. The use of baskets hauled to the top by ropes is attested by occasional scored marks on the walls of the shafts; and it must be remembered that frost-weathering of the mouths of the shafts and their margins will have destroyed any possible traces of timber structures at the pit-head.

The problems of constructing Neolithic earthworks, such as causewayed camps, long barrows, henge monuments and cursuses, have recently been discussed in the light of the experience gained in building the experimental earthwork on Overton Down, near Avebury.[6] The calculation of the human effort involved in these undertakings, even with this experimental basis, is still full of uncertainties; but it is perhaps a little too simple, in estimating, say, the effort needed for the building of the Avebury earthwork, merely to scale up linearly the output per man/hour attained at Overton Down. In all earthworks the process of construction can be divided into two groups of operations: the loosening of subsoil and the filling of baskets *in the ditch*, and the transport and dumping of the basket-loads *on to the bank*. In the former the rate of production is independent of the size of the ditch, and will vary only with the hardness of the material excavated; whereas the latter is clearly related directly to the scale of the earthwork concerned. If allowance is made for this in calculation, a revised estimate for the effort required at Avebury would be 156,000 man-days, or 100 men for three years and three months.[7]

The plans of many of these earthworks, and particularly those of a ritual character, raise the interesting question of their builders' knowledge of plane geometry. Circular earthworks could of course be set out very simply, by means of a taut cord of fixed length rotated round a peg at the centre. An elaboration of the same method was doubtless used for certain British stone 'circles' of non-circular plan, such as Boscawen-un and Rough Tor in Cornwall, which have been discussed by Professor A. Thom.[8] These anomalous settings appear to be made up of several circular arcs of differing radii, symmetrically disposed, a smooth transition from one arc to the next being achieved through the choice of centres lying on a common radius.

It is possible too that some of the henge monuments which approximate in plan to ellipses, such as the Devil's Quoits in Oxfordshire[9] and Cairnpapple in West Lothian,[10]

[6] ANTIQUITY, 1961, 129.

[7] As a first approximation I have arrived at the empirical formula $H = V(120 + 8L + 2F)/1000$, where $H$ equals the total man-hours required, $V$ is the volume of solid chalk excavated in cu. ft., and $L$ and $F$ are respectively the vertical and horizontal distances in feet between the centroids (the 'centres of gravity') of the cross-sections of the ditch and bank as originally constructed. I shall be glad to discuss the derivation of this formula with any interested reader.

[8] *Mathematical Gazette*, XLV, 1961, 83–93.

[9] W. F. Grimes, *Excavations on Defence Sites, 1939–45*, I, 1960, 149, fig. 60.

[10] ANTIQUITY, 1949, 32, fig. 1.

were set out in the same way, as a combination of circular arcs. Pending detailed analysis, it seems at least as likely, however, that they were planned as true ellipses, by means of a cord fastened at its ends to two separated pegs (located at the foci of the ellipse) and stretched taut by a moving stick which would trace out the circumference. The same method is used for drawing ellipses in school geometry exercises, using two pins, a length of thread and a pencil.

For rectilinear monuments, such as the mounds of long barrows and chambered tombs, the boundaries were presumably fixed by means of lateral offsets from an axial base-line. There is some evidence, however, that the offsets were not arbitrarily chosen, but were related to a basic geometric figure of simple proportions. The truncated wedge-shaped outline of the chambered cairn of Parc-le-Breos Cwm in Gower,[11] for instance, appears to be based on an isosceles triangle with sides in the ratio of 4 : 1, and the chamber and forecourt of the West Kennet Long Barrow[12] on a similar triangle with a ratio of 2 : 1.

The method of offsets seems to have been used also in monuments of the cursus type, one side of which is sometimes noticeably straighter and more regular than the other,[13] and was presumably taken as the base. The same monuments also occasionally have their ends accurately squared off at right-angles,[14] as are the corners of parallel-sided chambered tombs such as Wayland's Smithy in Berkshire or Tinkinswood in Glamorgan. The problem of setting out such right-angles is of course amenable to solution by trial and error, through successive approximations based on the measurement of the diagonals of a parallelogram; but this in itself implies some theoretical understanding of plane geometry. We cannot rule out the possibility that the Pythagorean method used by field archaeologists today, of laying out a triangle with sides in the ratio 3 : 4 : 5, was known to our Neolithic ancestors.

Of possible Neolithic units of measurement I propose to say nothing, if only for lack of incontrovertible evidence and because the contemporaneous use of variant standards is extremely probable. The detection of such units is in any case a matter of fairly rigid statistical analysis, based on data which should for preference be taken in the first instance only from sites whose basic geometric framework exhibits simple proportions of the kind already mentioned.

I turn now to the final category of Neolithic engineering, the building of tombs and ritual circles of large stones. The work involved can be divided into three basic operations: the transport of the stones from their source to the site; the erection of upright stones; and the raising of the capstones of chambered tombs (and, by an illegitimate extension of the term 'Neolithic', the lintels of Stonehenge).

For transport, a water route is to be preferred for economy of effort; but it is probably only in the exceptional case of the bluestones of Stonehenge that full advantage could have been taken of this method. In Neolithic times, when the width, depth and course of rivers and streams was determined wholly by natural agencies, and not by man, it is very doubtful if a load of more than 10 tons could be carried satisfactorily by water. Moreover, the majority of megalithic constructions, at any rate in Britain, are on high ground, away from running water, and are built of materials available close at hand, within a few miles at most. The main problem is thus that of transporting overland stones weighing up to about 50 tons.

[11] Re-excavated and restored for the Ministry of Works by the writer in 1960 and 1961. Report to appear in *Archaeologia Cambrensis*.

[12] I owe this observation to Professor Stuart Piggott, whose report on the site is in the press.

[13] e.g. the Dorset Cursus (ANTIQUITY, 1955, 9) and the Benson (Oxon.) Cursus (*Ant. Journ.*, XIV, 1934, 414, pl. LVII).

[14] e.g. that at Benson cited above, and the neighbouring site at Sutton Courtenay (Berks.), *ibid.*, pl. LVIII.

For this the most economical method is the use of a sled and rollers, hauled by a party of men. The strongest form of sled would be one whose main longitudinal members were formed of a natural pair of forked tree-trunks, in the shape of a modern tuning-fork, joined by nature at their bases and braced transversely by cross-members morticed and pegged. Such sleds have been used by the Naga peoples of Assam in modern times for precisely the same purpose.

The rollers were presumably selected lengths of cylindrical tree-stems, with the bark and any small branches carefully trimmed off. Since the rollers would have to be wider than the width of the sled-runners, and would form a tiresome series of obstacles for a hauling-party on an axial line, it seems reasonable to suppose that ropes were attached to a draw-bar which projected on either side of the sled far enough to clear the ends of the rollers, even though the advantages of such an arrangement would be offset by the necessity of maintaining an even tension on both sides.[15] Alternatively, the hauling party must have been sufficiently far in advance of the stone to leave a space in which the roller track could be laid, behind the rear rank and in front of the advancing sled. In either case the limited working load on a single rope demands that the hauling party should be disposed either in parallel files or in the form of a fan of narrow angle.

On flat ground the *minimum* hauling party would be two men per ton, or 100 men for a 50-ton stone. In the latter case, we may assume at least another hundred men for shifting the rollers and steering the sled. A single roller of hardwood, 10 ft. long and 1 ft. in diameter, weighs about 4 cwt. and would need a team of six to eight men to carry it. A softwood roller of the same size weighs a little more than half this figure, but is more easily damaged and more rapidly abraded by the runners of the sled.

On slopes, whether up or down, the minimum size of the hauling party increases rapidly. For a gradient of 1 in $6\frac{1}{2}$, or about 9°, nine men per ton are required, as against two on flat ground.

For the methods used in the erection of upright pillars or slabs we have hardly more evidence than for their transport; but such as there is suggests that the same basic method[16] was used in all cases, though with some important modifications at Stonehenge.

Once the position of the hole had been decided, it was dug to a suitable depth with three sides approximately vertical and the fourth, facing the direction from which the stone was to approach, in the form of a sloping ramp. The side opposite the ramp was then lined with close-set wooden stakes, to protect it from being crushed by the toe of the stone during its erection.

The stone would then be rolled along the ground, base foremost, to a position in which the toe was nearly touching the stakes, and the centre of gravity was a short distance behind the leading roller, while the latter was just short of the edge of the ramp, in which position it could be held by stakes to act as a fulcrum in the next operation. The necessary starting-positions for the stone and the leading roller, in relation to the hole and ramp, could be found without difficulty by previous trial and error.

The next step would be to lever up the outer end of the stone, so that the toe gradually dipped into the hole. Since the weight of the stone would be very nearly balanced on the leading roller, the amount of leverage, even for a very heavy stone, would be small, and the degree of control proportionately large. In this way, as model experiments have shown, the

[15] Such an arrangement is illustrated by Dr Brian Hope-Taylor in *National Geographic Magazine*, 117, 1960, 850–851.

[16] For diagrammatic illustrations of the processes described below, see *Stonehenge and Avebury*, H.M.S.O., 1959, 62.

toe of the stone could be brought to within a few inches of the bottom of the hole before the centre of gravity passed in front of the fulcrum, allowing the stone to slip a short distance and to come to rest leaning on the ramp and the leading roller, at an angle of up to 50° from the horizontal, depending on the depth of the hole.

A suitable crib of crossed timbers would then be built beneath the outer (top) end of the stone, to provide support for the fulcra of levers whereby it could be raised a few inches at a time. Temporary support would be given by timber struts when the crib had to be rebuilt at intervals closer to the stone.

At an inclination of about 70° from the horizontal the levers would become ineffective; but from this position the stone could be pulled upright by hauling on ropes attached to the top. The heaviest stone at Avebury, standing 17 ft. high and weighing about 47 tons, would require an initial pull of about 9½ tons from an inclination of 70°. This could be exerted by a team of slightly more than 200 men, if each is assumed to be able to exert a pull of 100 lb. over a short period of time. The raising of a stone is thus in general within the capacity of the total number required to transport it on flat ground.

It is true that today the stone-holes at Avebury and elsewhere are extremely shallow—too shallow, indeed, to allow the stone to be tipped in under control and to come to rest in a stable leaning position. But it must be remembered that during the course of the last four or five millenia soft rocks such as chalk and limestone have been dissolved to depths of up to 2 ft. by chemical weathering,[17] so that the original depth of the holes was correspondingly deeper. At Stonehenge the holes appear to have been unusually deep in the first instance, presumably to allow for the narrow proportions and greater length of the uprights, which result in the centres of gravity being further from the bases than is common elsewhere.

The raising of the capstones of chambered tombs presents few difficulties, if it is assumed that the mound surrounding the chamber was first built up to the level of the tops of its walls, to provide a sloping ramp up which the capstones could be hauled and levered, resting on rollers. The main necessity would be the very careful strutting of the chamber walls to resist lateral pressure; and indeed it seems probable that the interior of the chamber was packed solid, either with rammed earth or with lengths of timber wedged in place, the packing being removed, not perhaps without some trepidation, only after the capstones were all in place.

The uprights forming the walls of many chambered tombs stand in very shallow holes, often no more than 9 in. in depth, which at first sight give an impression of criminal optimism on the part of the builders. It must be remembered, however, that once in place the weight of the capstones provides sufficient friction to prevent relative movement of the component slabs. This is well demonstrated by tomb-chambers which have subsequently lost their supporting mounds, like Kits Coty House in Kent and many of the *allées couvertes* of France.

The raising of the lintels of Stonehenge presents another problem altogether, but one on which I have nothing to add.[18]

In conclusion, I would stress again that it is worth while considering the technological aspects of the products of Neolithic engineering, as well as their significance in cultural or chronological terms. These monuments are after all the only direct evidence that we have for the existence of prehistoric *communities*, which otherwise we can infer only from the repetitive occurrence of similar artifacts in individual graves or habitation-sites, which

[17] ANTIQUITY, 1957, 228–233.
[18] See on this R. J. C. Atkinson, *Stonehenge*, Pelican, 1960, 134–139.

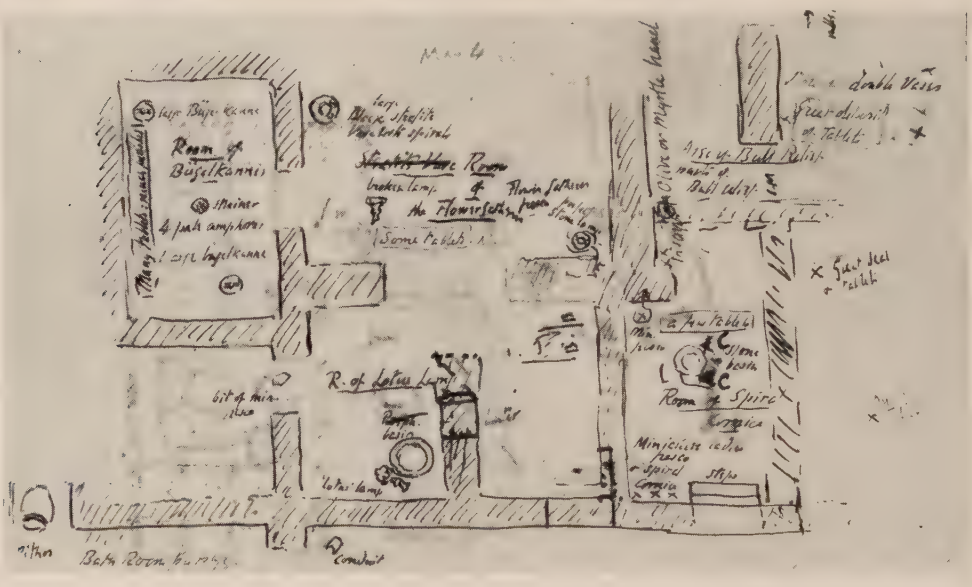
EDITORIAL

*Historical photograph of the excursion of the* Association Française pour l'Avancement des Sciences *to the cave of La Mouthe, in August,* 1902. *The outcome of this excursion was definitive recognition of Quaternary cave art. The Abbé Breuil* (25 *years old*) *is second from the right. Seventh from the right* (*standing*) *is Adrien de Mortillet, and next to him* (*holding a candle*) *Emile Carthailhac* (*see p.* 257).

[*Photo: Archives H. Breuil, from* Four Hundred Centuries of Cave Art.

(*a*)

(*b*)




(*a*) EDITORIAL: *A stone circle built on a cliff overlooking the Columbia River at Maryhill (Washington) in the twenties of this century: it is known as 'Stonehenge', (see p. 260).*

[*Photo: supplied by Dr. Bu'lock.*

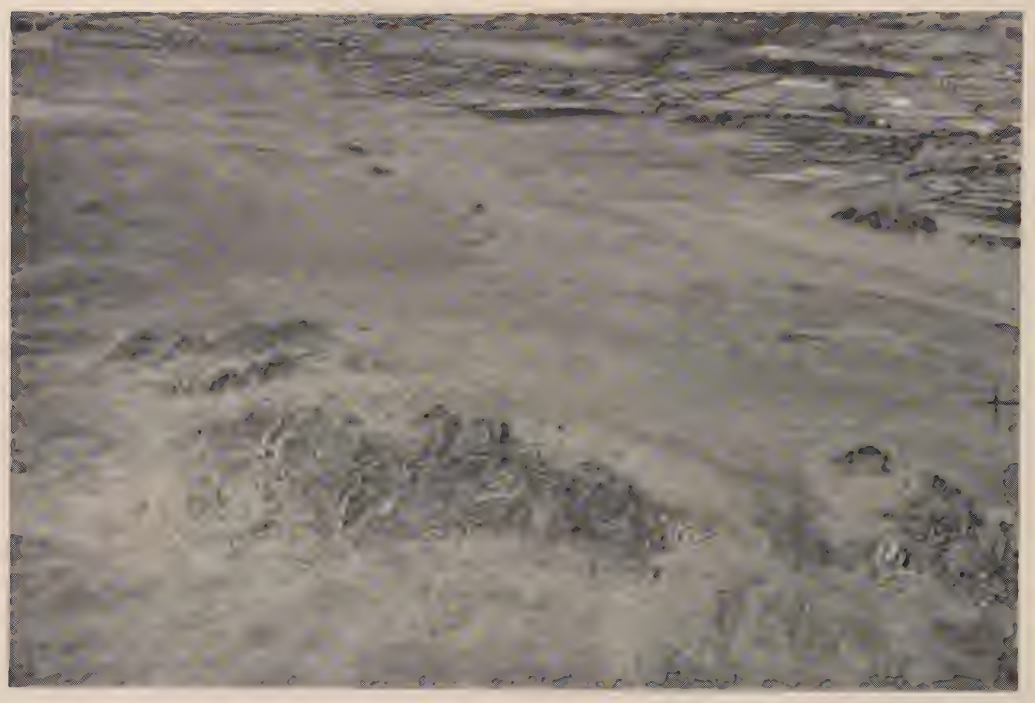
(*b*) KNOSSOS: *Sketch plan, dated 4 May, from Sir Arthur Evans's private notebook* (1900) *showing tablets and other finds in and to the west of the Northern Entrance Passage. Note 'some tablets' in the S part of the RSG. On 4 May,* 1900, *tablets here are recorded by DM as found 'on the clay floor'. At this point a reoccupation plaster floor was observed at a lower level in* 1923 (*unreported*). *All objects entered by AE as found in* 1900 *lay above this reoccupation floor. Opposite the doorway to the south is the end-block of the reoccupation wall, west of which,* 32 *cm. below the paving, were found the fragments of an LM II B pithos* (1923, *unreported*). *Note further: tablets along the west wall of the RSJ next to the Bügelkannes etc.; the Great Deposit in the NEP next to the double vases; smaller deposits, one with a great seal, to the south of this; tablets in the RSC* (*see p.* 308).

AERIAL RECONNAISSANCE IN WALES

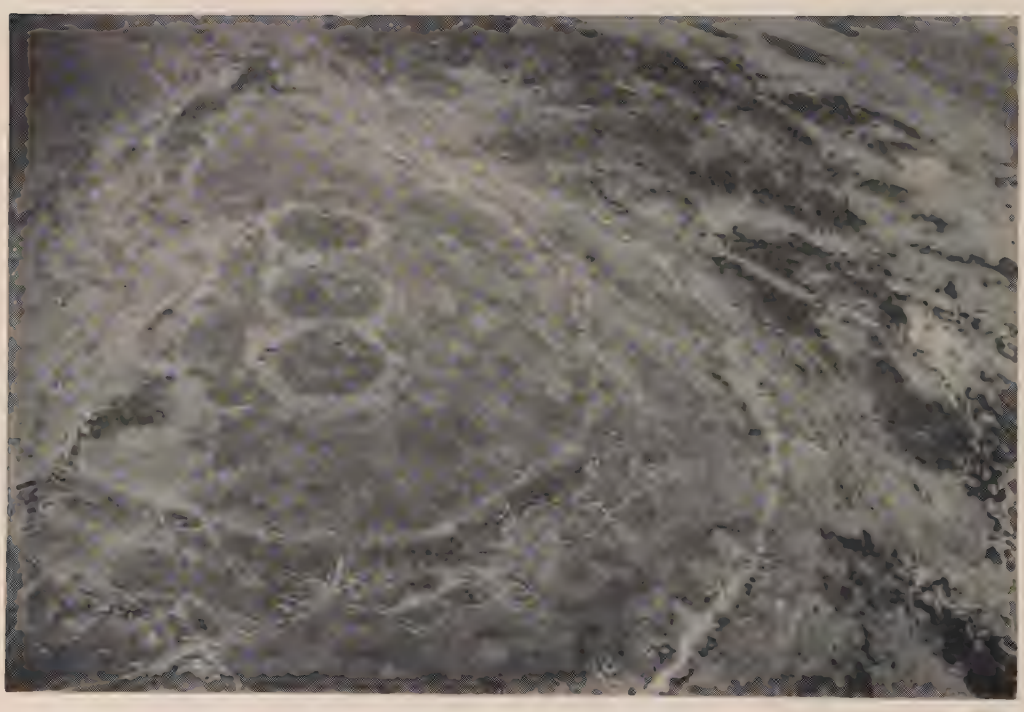
*'Henge' monuments, Llandegai, Caernarvonshire, seen as crop-marks: looking ENE* (*see p.* 264).

[*Photo:* J. K. S. St.Joseph: copyright reserved

(a)



(b)



AERIAL RECONNAISSANCE IN WALES

*(a) Carn Meini, Mynydd Presely, Pembrokeshire, looking NW. The 'bluestones' of Stonehenge were probably quarried from these outcrops of rock (see p. 265). (b) Hill-fort, Foel Trigarn, Mynydd Presely, Pembrokeshire, looking SW (see p. 266).*

[*Photos:* J. K. S. St.Joseph: Crown copyright reserved.

(*a*)

(*b*)

AERIAL RECONNAISSANCE IN WALES

(*a*) *Hill-fort, Twmbarlwm, Monmouthshire, looking SW* (*see p.* 266). (*b*) *Earthworks, Llanmaes Hill, Glamorgan, looking W* (*see p.* 266).

[*Photos:* J. K. S. St.Joseph: copyright reserved.

(*a*)

(*b*)

AERIAL RECONNAISSANCE IN WALES

(*a*) *Hill-fort, Llanblethian, Glamorgan, looking E* (*see p. 266*). (*b*) *Hill-fort, Carn Ingli, Pembrokeshire, looking SW* (*see p. 266*).

[Photos: J. K. S. St. Joseph, copyright reserved.

(*a*)

(*b*)

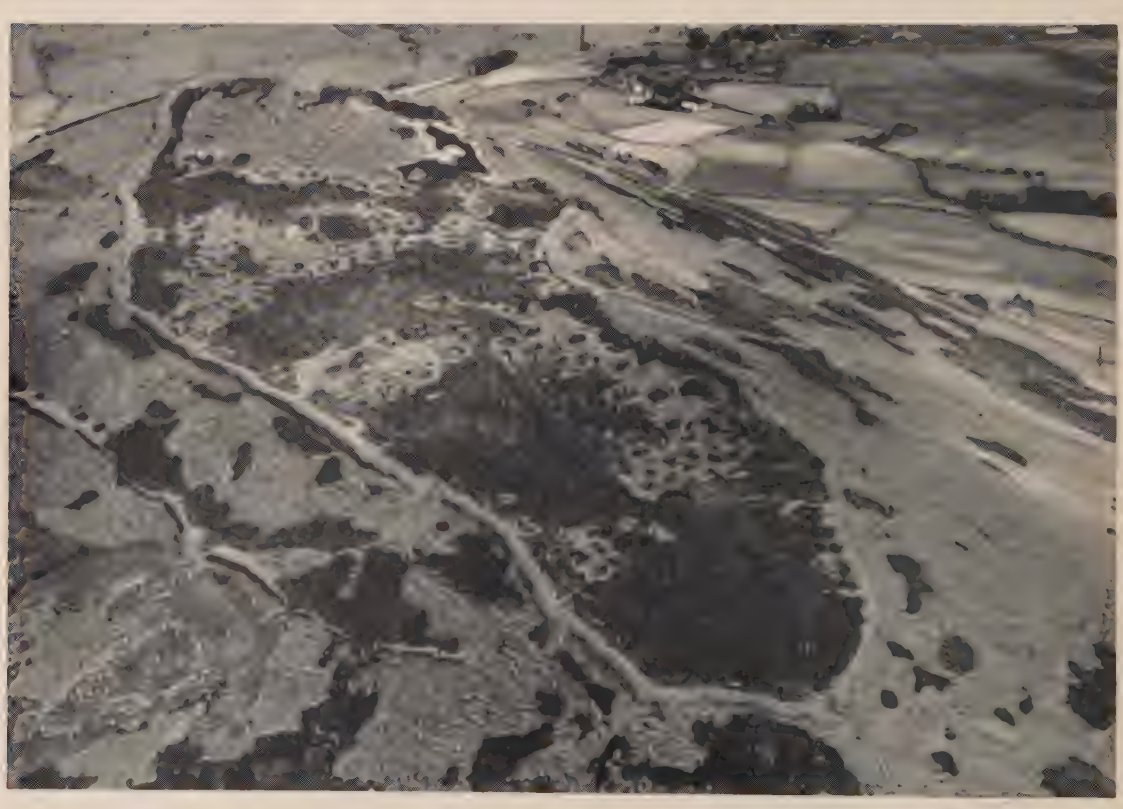
AERIAL RECONNAISSANCE IN WALES

(*a*) *Native settlement, St. Harmon, Radnorshire* (*see p.* 268). (*b*) *Roman fort, Trawscoed, Cardiganshire, looking NE. The part of the fort lying below the belt of trees is seen as crop-marks* (*see p.* 272, *and cf.* FIG. 2).

[*Photos:* J. K. S. St.Joseph: copyright reserved.

(*a*)

(*b*)



AERIAL RECONNAISSANCE IN WALES

(*a*) *Native settlement, Mynydd Ystrad Rhondda, Glamorgan, looking W* (*see p. 268*). (*b*) *Hill-fort, Tre'r Ceiri, Caernarvonshire, looking E* (*see p.* 267).

[*Photos:* J. K. S. St.Joseph: copyright reserved.

(*a*)

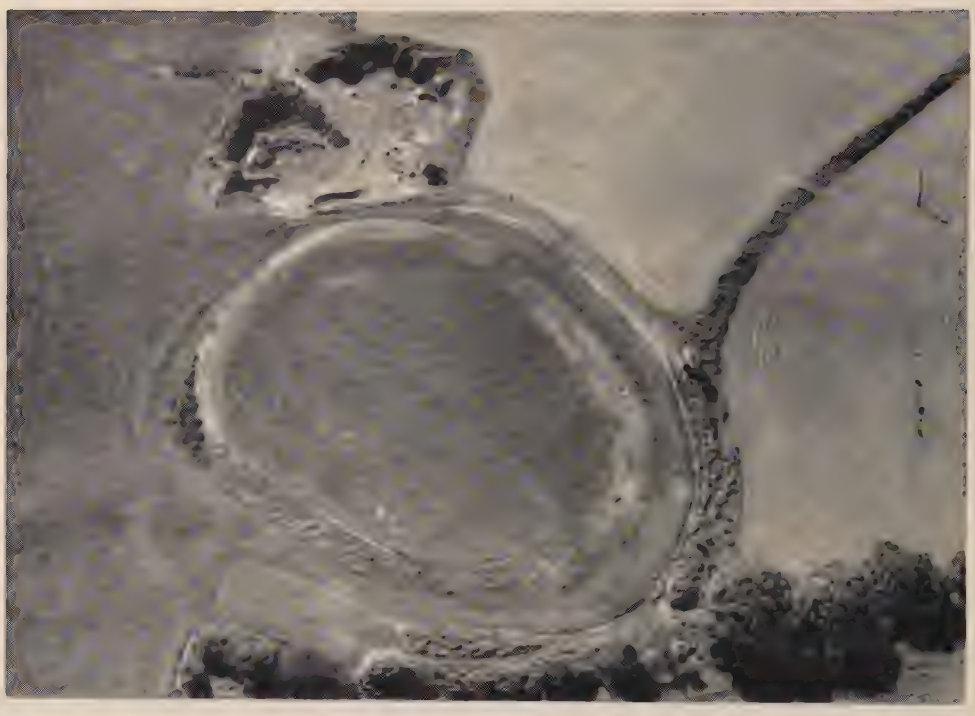
(*b*)

AERIAL RECONNAISSANCE IN WALES

(*a*) *Two Roman 'practice-camps', Mynydd Carn Gôch, Glamorgan* (*see p. 273*). (*b*) *Roman fort, Tomen-y-Mur, Merionethshire, looking WSW* (*see p. 272*).

[*Photos* J. K. S. St.Joseph copyright reserved.

(a)

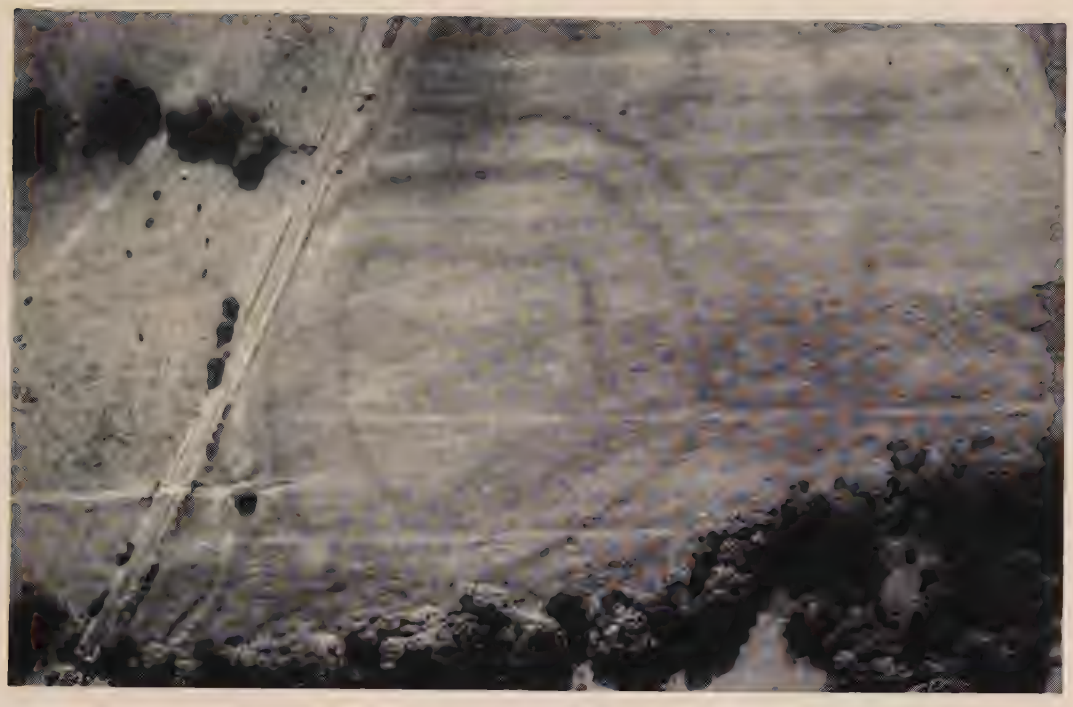


(b)

AERIAL RECONNAISSANCE IN WALES

*(a) Dark Age fort, Vaynor Gaer, Pembrokeshire, looking W (see p. 274). (b) Dark Age settlement near Ludchurch, Pembrokeshire, looking S (see p. 274).*

[*Photos:* J. K. S. St.Joseph: copyright reserved.



(*a*)

(*b*)

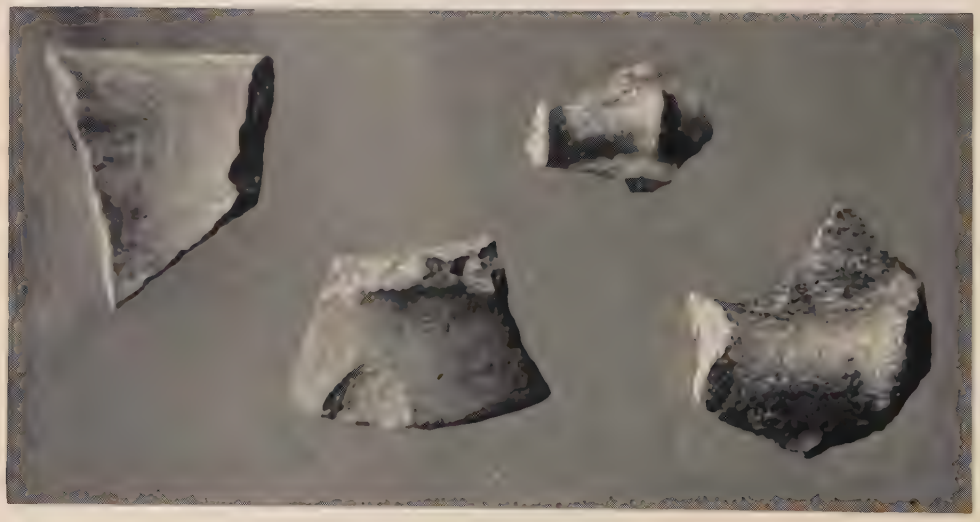
AERIAL RECONNAISSANCE IN WALES

(*a*) *Prehistoric native settlement, north-west of Castle Caereinion, Montgomeryshire, seen as crop-marks* (*see p.* 268). (*b*) *Dark Age fortified settlement, north of Walton East, Pembrokeshire* (*see p.* 274).

[*Photos:* J. K. S St.Joseph: (*a*) copyright reserved, (*b*) Crown copyright reserved.

(*a*)

(*b*)



SKORBA

*Skorba, the new Maltese temple. (a) The back wall of the courtyard. The slot in the foreground penetrated the pre-temple levels. (b) Sherds of the newly discovered phase in the Maltese prehistoric sequence* (*see p.* 300).

we interpret (no doubt rightly; but it is still a matter of inference) as the expression of a communally acceptable pattern of behaviour.

Moreover, considerations of a purely mechanical type may occasionally lead to conclusions about the social or economic structure of our prehistoric communities, on which evidence of any kind is all too rare and too equivocal. It is a fact, for instance, that the capstone of the burial chamber at Tinkinswood in Glamorgan weighs approximately 50 tons, and that not less than 200 able-bodied persons, representing a total population of not less than 300, would be needed to get it into its present position with the means currently available. The chamber itself contained 'at least fifty' individuals--an abnormally high number. Even so, if we assume, as we safely can, a crude death rate of 40 per 1000 per annum, a population of 300 souls would incur that number of deaths in just over *four years*, an impossibly short period of use for a structure of this character. We may thus assume that this tomb, and by inference many others, are not the mausolea of a whole local population, but only of one small fraction of it; from which it follows that the structure of Neolithic societies in Western Europe may have been a great deal less egalitarian than the lack of differentiation in their artifacts might lead us to suppose.


# BRITISH MUSEUM PUBLICATIONS

## CUNEIFORM TEXTS FROM BABYLONIAN TABLETS

Vols. III, VII, VIII — each £1 5*s*. 0*d*.

These reprints make available again to students the cuneiform texts of Old Akkadian, Old Babylonian, Neo-Sumerian, Assyrian and Neo-Babylonian inscriptions in the Museum's collections.

Vols. IX and X to be published shortly.

*Forthcoming:*

## HIEROGLYPHIC TEXTS FROM EGYPTIAN STELAE, ETC.

T. G. H. James. Part I, second edition.

The inscriptions on all the sculptures (except those in the round) dating from the Old Kingdom (c. 2680–2200 B.C ) now in the Egyptian collection of the Museum are edited in this volume, many for the first time. The volume also includes full descriptions of the sculptures and detailed indexes of names and titles.

ALL ORDERS TO BE SENT TO THE DIRECTOR (PUBLICATIONS), LONDON, W.C.1

# Skorba, Malta and the Mediterranean

by DAVID TRUMP

*Professor Bernabò Brea, in his review of Professor J. D. Evans's* Malta (ANTIQUITY, 1960, 132), *did not dispute the sequence of cultures there described, but he questioned the interpretation of this sequence in three important particulars, namely, the continuity between the first (Għar Dalam) and later phases of Evans's sequence, the absolute chronology of the Neolithic period, and thirdly the role which Malta played in the prehistory of the Central and West Mediterranean. These three criticisms were met by Evans* (ANTIQUITY, 1960, 218) *and now Dr D. H. Trump, Curator of Archaeology in the Malta Museum, discusses all these problems in relation to his recent excavations at Skorba.*

IN his reply to Professor Brea's criticisms, Professor Evans was prepared to concede the point of absolute chronology for the earlier stages[1] but held firm to his original chronology relative to Sicily and Greece, to his late absolute date for the collapse of the temple civilization and its replacement by Bronze Age immigrants, to the completeness of his original sequence, and to his interpretation of Malta's role. On the evidence then available, I found myself strongly in favour of Evans's views as against Brea's. Since then, excavations by the National Museum of Malta at the hitherto untouched temple site of Skorba, with subsidiary work at Mġarr, Kordin III and Santa Verna, have produced further evidence bearing on this controversy.

Leaving aside the later phases of Evans's sequence, for which there was ample stratigraphic proof on a number of sites, the first three were placed in order on the basis of three lines of reasoning. From a typological study of the pottery, a simple unilinear scheme commended itself—impressed associated with cut-out decoration (Għar Dalam, identical with Stentinello in Sicily), cut-out alone, now curvilinear (Mġarr), narrower cut-out or wide scratched (Żebbuġ—being done after firing, either term could be used), narrow scratched (Ġgantija), very fine scratched (Tarxien). Brea's doubts arose from the need for something in Malta to correspond to the Diana phase in Sicily (Evans regarded Diana as running parallel to San Cono, to which Żebbuġ is fairly closely related), leading him to question incidentally the development of Mġarr from Għar Dalam.

The typology of the temples supported Evans's scheme. They were held to develop from rock-cut tombs through simple lobed examples to those with trefoil plan, which led on to the great five- and seven-apse temples. The earliest examples of each contained sherds of Mġarr date (the Xemxija tombs), Mġarr (the smaller temple at that site), Żebbuġ (the larger building at Mġarr), Ġgantija (many examples) and Tarxien (the central temple there) respectively, though each type survived until much later.

Thirdly, though no Għar Dalam level was identified, a trench at Kordin III produced a stratigraphy giving further confirmation of the second to fourth phases—torba and clay

[1] A C14 date of 2690 ± 150 B.C. from Mġarr was published in ANTIQUITY, 1961. The reasons for applying it to the Żebbuġ rather than to the Mġarr phase are given below.

floors with Ġgantija sherds, then levels with Ġgantija and Żebbuġ, and with Żebbuġ and Mġarr, apparently overlapping these two transitions, over sterile clay and bed rock.

The new temple at Skorba,[2] a large trefoil of Ġgantija date, fitted neatly into the sequence, but underlying levels could not be so easily reconciled (FIG. 1 and PLATE XLIV (*a*)). Għar Dalam's position at the beginning of the series was confirmed in several trenches, and later at Mġarr and Santa Verna also, but it was overlain by an average of 50 cm. of pure

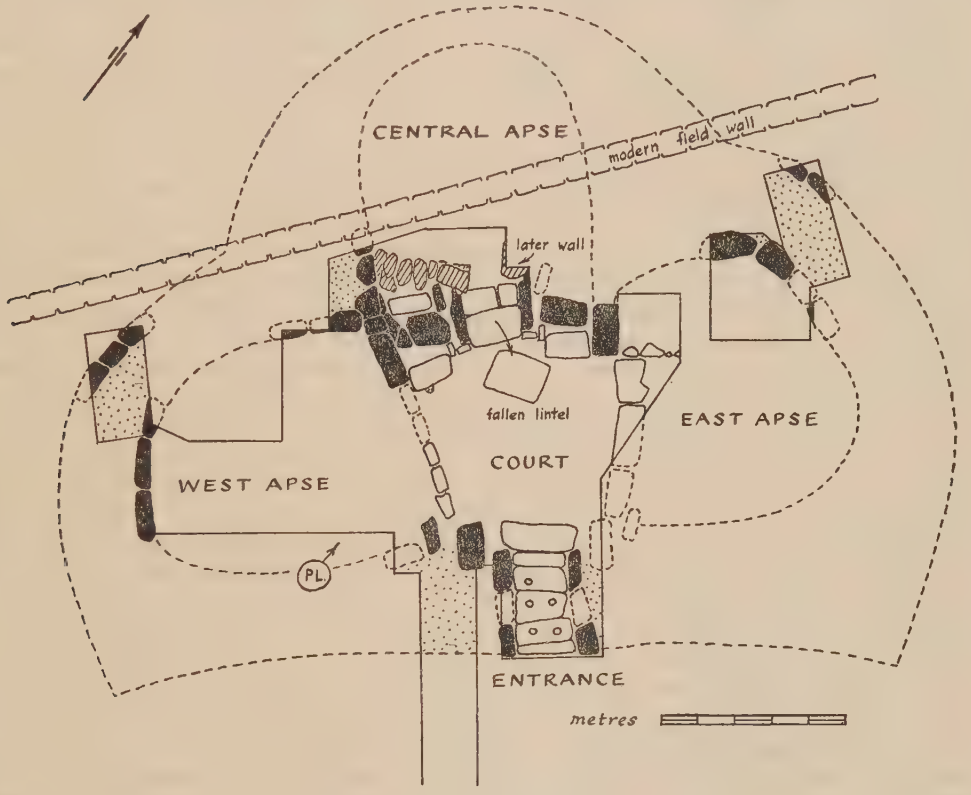



*Fig. 1. Plan of the temple at Skorba after the first campaign.*

deposit—in some places this lay directly on rock—containing an unrecorded ware for which the name 'Skorba' immediately suggests itself. It bears certain resemblances to Sicilian Diana in, for example, its markedly splayed lugs (PLATE XLIV (*b*)). Other features were a complete absence of decoration, pedestal sherds, simple open rims, and a dark burnished ware distinguished by very frequent small white grits. This occurred also in certain Għar Dalam sherds, where the pedestal was also recognized. Decoration occurs on only a small proportion of the latter, 4–8 per cent, as we can show now that we have pure levels of it for analysis. A derivation of Skorba from the earlier phase can therefore be tentatively suggested.

In one trench at Skorba, the upper part of this deposit contained Żebbuġ sherds with no change of soil. In a slightly different form, the fabric unaltered but now red-slipped

[2] A preliminary report appeared in the *Illustrated London News*, 12 August, 1961.

and with true trumpet lugs, the Skorba ware continued as a minor element in association with the Żebbuġ wide scratches and red on yellow painted. This version of Skorba is to all intents and purposes identical with Diana.

The discovery of Skorba ware immediately destroyed the argument from the pottery typology, and its apparent stratigraphic continuity with Għar Dalam below and Żebbuġ above cast doubts upon the position of Mġarr in the sequence. This was present at Skorba, but only in later mixed levels. When the question was reopened, other anomalies appeared. The Xemxija tombs contained Mġarr, Ġgantija and later sherds, but none of Żebbuġ type. A common decorative technique in Mġarr, surviving into Ġgantija, is a cut-out line with a light fringe, which is represented in Żebbuġ by a line edged with much coarser chipped triangles or even free-standing dots. Sherds intermediate between Mġarr and Ġgantija, with the latter's characteristic designs in the former's technique, are known. Certain Ġgantija vessel shapes have more convincing prototypes in Mġarr than in Żebbuġ.

Accordingly, exploratory trenches were cut at Mġarr. Żebbuġ sherds were the only ones found in the wall filling of the larger trefoil temple, supporting Evans's date for this. In the smaller, lobed temple, supposedly the oldest, one trench found a small patch of habitation material on the lowest floor containing Saflieni (early Tarxien) sherds, the other a level passing beneath its wall with Ġgantija material in it. This temple was therefore later than the other and much later than Evans had thought. Confusion had arisen from two facts. Many small earlier sherds had been imported with the clay used in successive re-floorings,[3] and the lowest floor was simply the cleaned surface of a much earlier, Żebbuġ phase, level,[4] undisturbed by the temple building. Għar Dalam ware was again found below this, lying immediately over the rock.

The correct position of Mġarr in the sequence, between Żebbuġ and Ġgantija, is now given by the larger temple there. Zammit found a quantity of large sherds of Mġarr type in it in the original excavation in 1927,[5] unlikely to have been brought in accidentally. They are therefore stratigraphically later than the Żebbuġ sherds in the walls. At the same time, they corroborate to some extent a Żebbuġ date for the temple, which must have been in existence by the Mġarr phase to receive them. This second point is important too because we now have no other temple earlier than Ġgantija.

The last point to check was the stratigraphy at Kordin III which had seemed to clinch Evans's scheme. The 1961 trenches, either side of his, found pure Ġgantija levels, below these a mixed stratum with Ġgantija, a little Mġarr and a little Żebbuġ, below again Mġarr with a few Ġgantija sherds, over rock virtually pure Mġarr. The very scanty Żebbuġ material, and incidentally two worn Skorba sherds, are clearly secondarily derived, which must explain the misleading 1954 results. Leaving them aside, the transition from Mġarr to Ġgantija in these levels, without an intermediate Żebbuġ one, is quite clear, and a natural corollary of the Skorba-Żebbuġ transition at Skorba.

This run-on of Skorba to Żebbuġ was found again in the course of the re-investigation of Santa Verna. Beneath floors of Saflieni and Ġgantija date, a pit through Għar Dalam clay into sterile natural clay contained Skorba ware pure at its bottom, and mixed with Żebbuġ at a higher level.

[3] A similar explanation was found for the anomaly at Tarxien (*Malta*, 122), a phase D temple demolished and rebuilt on the same plan in phase E. In 1960 a Tarxien period floor was found underlying the imported fill containing the earlier, Ġgantija, sherds.

[4] This was found to have happened at Skorba and Santa Verna also. The tested carbon samples were collected in this floor, where no sherds later than Żebbuġ were found.

[5] *Museum Annual Report*, 1926–27, p. 1, and Sir Temi Zammit's original notebook.

Summing up then, as a result of excavations during the summer of 1961 the Maltese Neolithic sequence must be re-written: Għar Dalam—Skorba—Żebbuġ—Mġarr—Ġgantija—Saflieni[6]—Tarxien. This has an important bearing on the controversy between Evans and Brea at several points.

The C14 date of 2690 ± 150 B.C. now attaches to the Żebbuġ phase, suggesting an initial date for the human occupation of Malta certainly within the fourth millennium. On the date of the end of period I, the fall of the temple civilization, I prefer Evans's arguments to Brea's. Tarxien Cemetery, the first phase of period II, must overlap Capo Graziano in Lipari, but not necessarily more than its very end. The commonness of its faience beads shows that its peak was certainly late. Equally Tarxien must overlap shaft-grave Mycenae, but here only the very end of the former, since it is clear that the relief spiral decoration on stone slabs in Maltese temples, which personally I cannot dissociate from similar carving on stone slabs at Castelluccio and Mycenae, are a late addition to these temples, at Tarxien itself succeeding the completely different décor of pitting. The date of the transition to period II could go back to about 1550, to 1600 at most. I am suggesting 1550 elsewhere[7] on the evidence of the chronology of the Maltese Bronze and Iron Ages.

As regards the correlations with Sicily, Evans's placing of San Cono (= Żebbuġ) and Diana (= late Skorba) as parallel developments is confirmed by the association of their Maltese equivalents.[8] We have indeed found the earlier phase Brea asked us to, but it is not quite what he hoped for. We must now, in fact, ask him to find a similar proto-Diana ware in Sicily. It seems most unlikely that a complex which spread so widely, from Malta to mid-Italy, Skorba—Marmo—Diana—Apulo—Matera, could have derived from such a limited source as the Maltese islands.

The new turn of affairs also spoils the appearance of Malta as the originator of megalithic architecture. Its earliest manifestation here is now the sophisticated trefoil temple at Mġarr, of the Żebbuġ phase, at somewhere around 2700 B.C., no longer with recognizable prototypes. A source within the islands, though not excluded, is rendered much less attractive. Malta at this time was certainly open to influences from outside, as it is at this point that the new traditions represented by the Żebbuġ scratched and painted wares were imported from the north. It is also the date of the earliest collective tombs yet found here,[9] which point ultimately to the east. Megaliths on the other hand suggest the west to me. A few early C14 dates from Spain might save a lot of searching elsewhere.

As the temple civilization rises in Malta, so do foreign contacts disappear,[10] apart from the continued import of raw materials such as flint, obsidian and ochre not locally obtainable. Without these, Malta as a great pilgrimage centre is unconvincing. As a great emporium of trade it is incredible. Until shipping took to mid-ocean routes, Port Said to Gibraltar, Sicily to Tripoli, Tyre to Carthage, Malta was in the nature of an Ultima Thule. To coastwise traffic it led nowhere. Malta remains for me an example of splendid isolation until the Tarxien phase when its peace was disturbed, then shattered, perhaps by drought followed by armed invasion, in the 16th century B.C.

[6] The subdivision of Tarxien was already suggested by Evans, Saflieni being its earlier part.

[7] *Proc. Prehist. Soc.*, 1961, forthcoming.

[8] The autumn campaign has found a level with unmixed late red-slipped Skorba ware stratified below Żebbuġ, (cf. Brea at the Grotta Chiusazza, *Sicily*, 73), showing it to be at least in part anterior to the latter and a phase separate from both it and the grey Skorba. We have found not merely the earlier phase Brea asked for, but two. He must now find in Sicily a proto-Diana ware similar to our grey Skorba.

[9] These, at Żebbuġ, Buqana and Bużbeżija, were found as simple pits. The first certain rock-cut chamber tombs are at Xemxija, with Mġarr sherds their earliest contents.

[10] Mr Warwick Bray, working in Sardinia, has some evidence for connexions in either direction between Ozieri and Tarxien. Otherwise Malta's isolation seems virtually complete.

# Cannibalism in Early Britain*

by D. R. BROTHWELL

*Mr Don Brothwell of the Sub-Department of Anthropology in the British Museum (Natural History) here discusses whether anthropophagy in prehistoric Britain is fact or fiction.*

RECENTLY, in discussing the likelihood of cannibalism in a modern African tribe, Professor Evans-Pritchard (1960, 238) wrote: 'Difficult as it is to discover with any degree of certainty the past of a primitive people from traditions and personal recollections, these sources . . . are for most purposes of greater value than early European records about that people, which in matters requiring more than bare observation and the simplest of deductions have to be scrutinized with care and used with caution. This is particularly so when what they record has a sensational appeal, as is the case with statements about savages being cannibals, a subject which seems to have a morbid interest for Europeans . . . it is held that they often made statements without supporting them with evidence, that they showed a remarkable lack of judgement in their interpretations of evidence, and that they embroidered their descriptions with suppositions and exaggerations'.

A similar state of affairs would seem to be present as regards the identification of anthropophagy in earlier man, although in this case the blame would seem to fall squarely on the archaeologist and not on the traveller and missionary. The time seems ripe for a few comments about the identification of this practice, at least as far as it concerns prehistoric British skeletons. By far the most favoured explanation so far recorded for broken and scattered bones from the Neolithic period, and even as late as Iron Age times, is cannibalism. There are, of course, strong indications of this practice in the early African hominids (Dart, 1959, 189), in the Pithecanthropus and Neanderthal groups (Clark, 1946, 34; Leakey, 1953, 190) and possibly in the Upper Palaeolithic (Piggott, 1954, 48), although Loeb (1923, 28), considers it still rather questionable in the latter group.

Concerning later man, Greenwell (1865, 107) was one of the first to suggest that excavated fragments, in this particular instance from Yorkshire, were evidence of cannibalism. He writes, 'It appears to me, that, in these broken skulls and disjointed bones, we have the result of feasts', and these views were also shared by Thurnam (1869, 186). Later, however (1877, 545), he expresses some doubt at his original suggestion, admitting that other explanations were just as feasible. Smith (1884, 36), was even more doubtful and writes: 'For there are, without doubt, many matters in connection with the Early Britons, some of them so often repeated till they are popularly believed and generally accepted, but which have no foundation beyond probability. . . . Such, for instance, is the alleged sacrifice of human victims, and the cannibal feasts, often attributed to British warriors, which . . . I am very far from admitting proved'.

* My thanks are due to Mr Bernard Wailes for reading through this article and discussing it with me.

Although by the turn of the century, evidence of anthropophagy would appear to be looked upon far more critically, it was nevertheless still considered. Mortimer (1905, xxiv) wrote of his Yorkshire material: 'These scattered human bones are generally in far better preservation than those of the interment below. They have also a different appearance, as if they had been somewhat changed, probably by some process of cooking. Repulsive as cannibalism is, the evidence of its existence in the barrows of this neighbourhood seems to me so strong as to place its former practice beyond doubt'.

Of the considerable number of more recent writers who have considered human flesh eating, one or two may be mentioned in particular. De Laet (1957, 100) suggests that this procedure might be dictated by different circumstances, and writes: 'It may well be that among the first human beings cannibalism was merely one particular aspect of the quest for food; in more advanced communities, on the other hand, anthropophagy probably had a magical or ritual significance of which the inner meaning escapes us.' Klindt-Jensen (1957, 36), on the other hand, would seem to think that protein deficiency was a cause even in the later periods. He writes: 'The remains of cannibalism in the kitchen-middens seem to suggest a definite lack of food during this (Ertebølle) period'. Piggott (1954, 47), while recognizing this dichotomy, is not prepared to place the Neolithic Europeans in one category or another. 'It is difficult', he says, 'to escape from the conclusion that the Windmill Hill folk in England, in common with their continental relatives in the Western Neolithic, practised some form of cannibalism, utilitarian or ritual.'

Perhaps the most likely case of cannibalism in Neolithic Britain, so far recorded is the remarkable burial from Maiden Castle, Dorset. Although the elbow-, knee-, and ankle-joints were still in articulation, Wheeler (1943, 21) notes that 'the limbs and head had been roughly hacked from the body shortly after death, and three fruitless attempts had been made to obtain access to the brain by circular incisions'. He goes on to say that 'the cooking of parts of the body for the purpose of eating the flesh or of drinking the broth in which human flesh has been stewed, is not unthinkable in Neolithic Britain'.

Regarding the later periods, the opinions of Mortimer (1905, xxiv) have already been referred to. Childe (1949, 99), has also noted a Bronze Age site where 'Among the refuse was a jaw of a human being . . . perhaps a slave, if not the remains of a cannibal feast'. Of an even more recent culture Clark (1945, 101) writes: 'The frequency with which human bones . . . are met with on Iron Age A sites is consistent with cannibalism or with some form of exposure of corpses'.

To me, the surprising thing about all this evidence is that cannibalism was given as a probable explanation, usually without consideration of alternatives. In actual fact, the scattered fragments could have resulted from various causes. One obvious possibility is that they represent burials disturbed and scattered. It seem a reasonable assumption that the population of the British Isles in Neolithic times was not less than 20,000 each generation; and if this is so, then it seems very unlikely that more than a fraction of the community were privileged to be placed in large burial structures. Even a few persons who received unmarked shallow burial (if not the exposure of the corpse) would ensure plenty of bone fragments upon disturbance.

Alternatively, it could be that bones were removed from burial and used as a form of fetich.[1] The utilization of human bones for such purposes is certainly known in Africa today (Hogg, 1958, 91). The fact that in the recent excavations of West Kennet Long Barrow (Piggott, 1958, 238) an examination of the skeletal remains showed a peculiar lack of crania and long bones strongly suggests that some had been taken away after the bodies

[1] The idea of bone-robbing has aleady been suggested by Smith (1959, 161).

were reduced to skeletons. If this was indeed the case, then what was the reason for their removal? The most likely seems to be that they were used in some form of magico-religious procedure. The only alternative would appear to be the removal of certain bones for the purpose of remembrance or even worship. In recent times, for example, a widow in the Andaman Islands exhumes the skull of her dead husband in order to keep it by her (Koenigswald, 1956, 190).

In the case of the mutilated skeleton from Maiden Castle (Wheeler, 1943, 21), it is difficult to appreciate why brain eating and the stewing of the body were so favoured. Morant (1938, 61) had some time previously suggested a very likely parallel between this skeleton and mutilated skeletons from Michigan. Whether the multiple injuries were a deliberate and ritual procedure, or purely the result of a very savage homicidal attack must remain a mystery. The fact that multiple cuts can be received even in normal fighting is particularly evident in some of the skeletons from Zaimokuza, Japan (Suzuki, 1956, pl. 4–12), but the number and extent in this British case suggests that some blows must have been inflicted on the body after unconsciousness and even death.

What alternatives I have suggested here are not, of course, in most cases any more likely to explain isolated human remains with any greater certainty than the cannibalism theory, but it does seem necessary to keep them in mind nevertheless. Indeed, in any attempt to reconstruct cultural practices from the evidence of such remains, it seems extremely important to consider all possibilities. So far, it would seem that the practice of cannibalism has been more favoured than it should be. Moreover, even where this is the favoured hypothesis, it seems very unwise to suggest, as Klindt-Jensen (1957, 36) has, that this may denote a lack of food. Judging from the evidence of recent cannibal populations, there is by no means a clear correlation between lack of food and this practice, and indeed the Eskimo, who lead one of the most difficult lives of any human group, show a very decided aversion to the practice (Weyer, 1932, 120).

There is obviously room for far more research into the possible interpretations of such early remains, including an enquiry into possible differences between cooked and uncooked bone. Mortimer (1905, xxiv) has already presented the question of preservation, a matter which could be checked experimentally. Another line of enquiry deserving attention is that concerned with the chemistry of such bones. Oakley and Hoskins (1951, 240) have already noted that the burning of bone presents an obstacle to fluorination, and it might be that extensive cooking could affect the nitrogen content, if not the capacity to combine with fluorine.

## REFERENCES


Childe, V. G. 1949. *Prehistoric Communities of the British Isles*, London.

Clarke, G. 1945. *Prehistoric England*, London.

—— 1946. *From Savagery to Civilization*, London.

Dart, R. A. (with D. Craig) 1959. *Adventures with the Missing Link*, London.

Evans-Pritchard, E. 1960. 'Zande Cannibalism', *J. Roy. Anthrop. Inst.*, 90, 238–258.

De Laet, S. J. 1957. *Archaeology and Its Problems*, London.

Greenwell, W. 1865. 'Notices of the Examination of Ancient Grave-Hills in the North Riding of Yorkshire', *Archaeol. J.*, xxii, 97–117.

—— 1877. *British Barrows. A Record of the Examination of Sepulchral Mounds in Various Parts of England*, Oxford.

Hogg, G. 1958. *Cannibalism and Human Sacrifice*, London.

Klindt-Jensen, O. 1957. *Denmark Before the Vikings*, London.

KOENIGSWALD, G. H. R. VON. 1956. *Meeting Prehistoric Man*, London.
LEAKEY, L. S. B. 1953. *Adam's Ancestors*, London.
LOEB, E. M. 1923. *The Blood Sacrifice Complex* (Ph.D. Dissertation), Wisconsin.
MORANT, G. M. 1938. A review of: *The Younge Site: An Archaeological Record from Michigan.* By E. F. Greenman (University of Michigan, 1937) in *Man*, XXXVIII (54), 60–61.
MORTIMER, J. R. 1905. *Forty Years' Researches in British and Saxon Burial Mounds of East Yorkshire*, London.
OAKLEY, K. P. and HOSKINS, C. R. 1951. 'Application du Test de la Fluorine aux Cranes de Fontéchevade (Charente)', *L'Anthropologie*, 55, 239–242.
PIGGOTT, S. 1954. *The Neolithic Cultures of the British Isles*, Cambridge.
—— 1958. 'The Excavation of the West Kennet Long Barrow: 1955–56', ANTIQUITY, XXXII, 235–242.
SMITH, A. C. 1884. *Guide to the British and Roman Antiquities of the North Wiltshire Downs in a Hundred Square Miles Round Abury*, Marlborough College Natural History Society.
SMITH, I. 1959. 'Excavations at Windmill Hill, Avebury, Wilts, 1957–8', *Wilts. Archaeo. & Nat. Hist. Mag.*, LVII, 149–162.
SUZUKI, H. *et al.* 1956. *Medieval Japanese Skeletons from the Burial Site at Zaimokuza, Kamakura City*, Tokyo.
THURNAM, J. 1869. 'On Ancient British Barrows, Especially those of Wiltshire and the Adjoining Counties. Part I. Long Barrows', *Arch.*, LXII, 161–244.
WEYER, E. M. 1932. *The Eskimos. Their Environment and Folkways*, New Haven.
WHEELER, R. E. M. 1943. *Maiden Castle, Dorset*, Soc. Ant. Lond. Reports of Research Committee.

**BAGENDON**

*A BELGIC OPPIDUM*

A record of the excavations of 1954–56

*by* ELSIE M. CLIFFORD

with contributions by

M. Aylwin Cotton, Professor C. F. C. Hawkes, Derek Allen, M. R. Hull, Professor F. A. Ruddock, Dr. D. B. Harden, Clare Fell, and others

*Quarto, 340 pages* *58 plates* *71 figures*

**£3 3s. net**

TO BE PUBLISHED 18 DECEMBER, 1961, BY HEFFER, CAMBRIDGE

Bagendon was a major oppidum, the capital of the Dobunni, 'of a size and interest comparable with that at Camulodunum'. The site was occupied from about A.D. 20 to 50 when it was presumably replaced by Roman Corinium three miles away. This work 'has added', writes Sir Mortimer Wheeler, 'a new chapter to the protohistory of Britain'.

This volume gives a full account of the excavations, followed by detailed treatment of the various finds. A special feature is the study of the Dobunnic coinage, occasioned by the discovery of a mint at Bagendon. Pottery, metal-working, brooches, etc., are fully described and illustrated.

# Notes and News

## THE KNOSSOS TABLETS: SOME CLARIFICATIONS

PLATE XXXIV (*b*)

My own task in this matter is simple and non-controversial: it is to establish, after a lapse of sixty years, *by verbatim quotation from the records*, the find-data relating to the tablets. Mr Boardman, after receiving my excerpts, has courageously undertaken to devise hypotheses to explain away such facts as he chooses not to distort or ignore. It will be an adequate response simply to requote the facts and then to exhibit Boardman's reactions to them.

(1) Evans found his sole 'decisive' stratigraphic key in a 'hoard' of stirrup-jar tablets in the RSJ. I invited my critics to quote the inventory numbers. They cannot do so. We must learn to live with the uncomfortable fact that the 'hoard' consisted of a single fragment found 'Nr SW Entrance'. After thirty-five years' pondering on his material Evans could offer his fellow scholars by way of a 'decisive stratigraphy' nothing better than a complete fabrication.

(2) The tablets assigned to the RSJ in *P.o.M.* are referred to RSG in the Handlist. This is because RSJ + RSG are considered as a single room-space. DM/DB records the tablets as found 'on the clay floor'. This is decisive. So Boardman protests that these words, backed up by sketch plans from both DM and AE, are not in the rougher notes. In 1961, from his Oxford study, Boardman knows better than the excavator in 1900. We note simply his reaction: he finds himself obliged to protest against the primary record.

(3) Below the clay was a floor of 'cement'. In 1901 still deeper excavation was made. 'It turned out after an interval of 0·40 that an earlier floor level made its appearance. Part of this floor was cement, part consisted of a large slab' (DM/DB 8, IV, 1901, cf. *B.S.A.*, vii, 35, fn. 1). To avoid Boardman's confusion we concentrate on this slab. It was 0·40 below the top 'cement' floor. In 1923 the plaster 'which fitted on to it' proved to be of reoccupation-mainland type. Such are the simple recorded facts. Boardman dismisses my verbatim quotation as an assumption without discussion. He insists that the plaster fitting on to the said slab was on the upper cement floor. We allow experimentally his double adjustment: move the tablets from the clay floor down on to the top cement floor and the plaster up on to the same floor. Still, the tablets removed in 1900 must have been higher than the reoccupation plaster examined in 1923.

The obstinate facts have forced Boardman into a corner. No resource remains but to assault them. This he unhesitatingly proceeds to do: 'The NB's show no record of tablets found above the late plaster floor in the southern half of the RSJ'. I do not see what Boardman thought to gain by this reckless misstatement. At best he could befog his readers until the next number of ANTIQUITY. All I have to do is to reproduce Evans's sketch plan of 1900 (pl. XXXIV (*b*)). Here he entered 'some tablets' precisely in the southern part of the room next to the door. No centre slab appears as yet: this was uncovered in 1901 at the lower level. Scholars now have the irrefutable record before their eyes. They can assess Boardman's claim to 'a high degree of precision'; they can judge how far efforts are being made to mislead them in advance of my full publication of the testimonia. Add that the important information about the reoccupation plaster floor, observed in 1923, was not reported until my article in 1961.

(4) The reoccupation plaster stretched south through the door into the next room. Opposite the door was the ramshackle end block of the late wall consisting of two re-used

door jambs; on the west side was the LM II B pithos, 0·32 below the level of the paving. Again, I was the first to report the facts. Evans said nothing about them or DM's firmly stated conclusion. And Boardman? Again a determined silence, masked by a diversionary skirmish about the wall on the east side of the room.

(5) We ascend to the Central Court. According to Evans we stand on an MM III pavement. But soundings in 1928 produced LM III sherds beneath it (above, p. 139). And Boardman? The evidence of the Stratigraphical Museum, generally available for some thirty years, now cannot be admitted until he and his pupil have re-examined it. In 1961, the basic facts of the Knossos excavations are still a task for the future, to be undertaken by a man already irrevocably committed.

(6) So far the revolt against the recorded facts has been concerned only with tablets SM 749–768. They form the meagre fringe of the northern deposit. I made a strong methodological point that our starting point must be the massive core of the deposit in the entrance passage. Boardman has a short and simple way with such difficulties. Apropos of the peripheral RSG he writes: 'it is central to his argument'. It is not central and there is no *argument*. But the central *fact* relating to the fringe deposit is the words 'on the clay floor' plus the two supporting sketch-plans showing the tablets alongside the stirrup jars. The reoccupation plaster discovered later at a lower level merely clinches the late dating.

(7) We turn to the 'Great Deposit'. Here Boardman cannot adjust the facts. This is DM's plain statement about the ceramic associations: 'The concurrence of the [double] amphorae with the inscriptions makes excavation in this extensive deposit a matter of excessive difficulty and slowness' (10 V, 1900). To the last Evans sited this deposit in this ceramic context. But Boardman in Oxford was not at a loss: on the strength of an old photograph he asserted that Mackenzie had failed to note the remarkable concurrence of burnt and unburnt material. Moreover, he maintained, there is no trace of conflagration anywhere in the reoccupied parts of the palace. I pointed to the 'Lapidary's Workshop of Reoccupation Date' (*B.S.A.*, vii, 20 f.; *P.o.M.*, ii, 763, iv, 594). It contained pithoi with burnt seeds, while the adjoining workshop had its floor covered with charred wheat. Boardman's retort to me is on record; 'Evans' dating accepted again when convenient'. This is his way of dismissing yet another inconvenient statement of fact.

Yet the primary find-data remain. How did tablets written *c.* 1400 B.C. get entangled with pots dated a quarter of a millennium later? Tablets, containers and sealings were shovelled in to made the earth floor, says Boardman. But Evans sited them above a 'well defined' reoccupation floor level. DM sites them at depths 0·50–3 m. with a major concentration, along with the LB III B pots, at 2 m. Some of the tablets were *above* the couple-amphorae! The facts remain obstinate: our (1) to (7) show that the whole northern deposit is situated in a clear LM III B context. All Boardman's manoeuvres are defensive and evasive. Note that there is no reference to a single piece of LM II pottery.

Similar evidence, similarly withheld, will in due course be communicated. Scholars will find, however, if they ignore the 'decisive stratigraphy' of the RSJ, that they already have enough information. Thus, the Sword Tablets, with others, were found 'in the upper strata' (*B.S.A.*, viii, 95) of the passage flanking the LM III B Shrine of the Double Axes. Evans firmly assigned them to the reoccupation (*S.M.*, i, 55). A sealing was found along with them. In 1904 boxes of arrow heads were found in the Armoury, again with clay sealings. Evans notes a significant fact (*P.o.M.*, iv, 618): 'The lion seal used for these impressions seems, curiously enough, to have been identical with that which had been made use of for a clay seal brought to light in association with the tablets containing lists of men [*S.M.*, ii, nos. 1517 ff.] found . . . near those relating to hoards of bronze swords'.

Thus sword-craftsmen and arrow heads in different parts of the palace provoked the use of the same seal. Mr Hood has told me that he accepts Evans's first dating of the Sword Tablets. Why should he be surprised to find his new scraps of tablet near the Armoury in a medium plentifully penetrated by LM III elements (*The Times*, 8 February, 1961, retracting *The Times*, 8 July, 1960)?

Boardman cites an expert witness against me. Mr Kenna has pronounced the clay sealings to be LM II. But the expert in this field, too, has much to learn from the archives of the Ashmolean Museum. One example: in *Cretan Seals* (*O.U.P.*, 1960, p. 43, fig. 71) the well-known sealing showing a bull's head with a double axe between the horns is dated MM III and located in the Temple Repository. The find facts are remarkably discrepant. In 1901 Evans found the Toreador Fresco in the little Court of the Oil Spout in the east wing. Next year he searched for more fragments; he found late walls built into the court with correspondingly late pottery, together with this sealing, which he drew in his notebook. In *P.o.M.*, i, 699, he dated it to MM III, but sited it correctly in the said court. In *P.o.M.*, iii, 265 ff. Evans admitted that he had been wholly mistaken about the pottery. The said court had been reconstructed and inhabited in the reoccupation period, sherds of that date having been found even below the massive threshold slab of the adjoining doorway. Mr Kenna has missed this recantation and added an error of his own, transferring the sealing to the Temple Repository lying to the south of the Throne Room. Thus a late sealing found in a court of the east wing has become an MM III sealing in a closed deposit of the west wing. This example may epitomize the chaotic state of knowledge about the raw physical facts of the Knossos excavations. We note that no stylistic doubts disturb the expert in his confident MM III attribution of a clay sealing found in a reoccupation deposit.

Boardman's own work swiftly benefited from my excerpts. In the *Cretan Collection* (*O.U.P.*, 1961, p. 6) he condemns H. Biesantz's LM II–III dating of a bronze, quoting *P.o.M.*, ii, 702. The bronze, he asserts, is MM III. In the Addenda we read: 'Subsequent examination of the notebooks of the excavations at Knossos shows that the bronze figure, Biesantz no. 18 may be as late as LM II'. I say, 'quite clearly the end of LM III'. But the important point is that Boardman unhesitatingly rejects the testimony of *P.o.M.* in favour of the Day Book. So do I.

I end on this note of agreement. I demur only at dismissing the whole of *P.o.M.* 'for our purposes'. All I say is 'ignore *P.o.M.*, iv, 733–736'.

Again, all will agree on the necessity for precision, and I gladly help Boardman in his difficulties over the DB entry for 4, v, 1900, referring to tablets 'extending along what seems to be the W wall of the space'. This W wall will be that along which the tablets extend; this is made clear by the final sketch plans of DM and AE (pl. XXXIV (*b*)). There were no tablets along the only other possibility, the partition wall, broken by the doorway, between RSG and its inner recess, the RSJ.

I hardly think Boardman really needed my help in solving this simple problem. Discerning readers will find it symptomatic that he chose to open his discussion with a quibble and an irrelevance. The real point of his opening paragraphs is to throw a smoke screen over the words 'on the clay floor' and the tell-tale reoccupation plaster below.

However, if the archaeologist could but learn to extend his professional precision to reading matter, no difference between us would remain. All is harmony between philology and *recorded facts*. No complex *ad hoc* hypotheses are needed. Mackenzie and Evans merit no rebuke for finding little or no trace of the thousands of stirrup jars which figure in the written records. Pendlebury need not be accused of elementary archaeological errors and the Stratigraphical Museum can remain unadjusted. Evans's LM III B dating of the mainland stirrup jars inscribed with Knossian place names need not be challenged.

Philologist and archaeologist may pay joint tribute to the greatest benefactor of Aegean archaeology. Homer led Schliemann to Troy, Mycenae and Tiryns; he led Blegen to Pylos; he led Evans to Knossos, where he found 'the Palace of Idomeneus'.

### Addendum

During a recent visit to Knossos more evidence bearing on the preceding paper came to light. Five notebooks of Duncan Mackenzie are preserved in the Taverna,[1] and by kind permission of Mr Sinclair Hood I was able to examine them. The books contain detailed descriptions of pottery with indications of find places. Important are the entries relating to the Area of the Wheat and the Area of the Chessmen, for these are the Lapidary's Workshop and the neighbouring room. Mackenzie's notes describe stirrup jars of a late type in these rooms and so substantiate Evans's firm dating to the reoccupation period. This date was challenged by Mr Boardman because the rooms contained charred beans and wheat. The new data dispose once and for all of the contention that there was no fire at the end of LM III.

Autopsy of the northern area fully substantiates DM's description (Antiquity, June, 1961, 137 ff.) of these rooms. The end-block showing the two dowel holes is still in position, as is the rough limestone block adjacent, with a gap originally filled by clay mortar. Plaster is still visible in the places described by Mackenzie; and in the RSG it is on a level with the central gypsum slab and not 40 cm. above it, as asserted by Mr Boardman before autopsy.

L. R. Palmer

[1] I had previously received information about them from Mr R. W. Hutchinson.

## THE CAMBRIDGE ANCIENT HISTORY

The minute book of the Press Syndicate at Cambridge for 11 March, 1896, has this sentence 'A suggestion as to a history of the World having been discussed it was agreed to recommend that Lord Acton be asked whether he would entertain the possibility of his undertaking the direction of such a work'. The first volume of *The Cambridge Modern History* was published in 1902, the first volume of *The Cambridge Mediaeval History* in 1911, and the first two volumes of *The Cambridge Ancient History* in 1923 and 1924. On 20 April, 1939, was published the final volume of the *Cambridge Ancient History*, and an enterprise which had taken forty-three years came to an end. But even long before 1939 it was realized that it could never come to an end. In the first place constant revision was necessary. The revision of the first two volumes of the *Ancient History* has been proceeding for some while, and its revision is now under the Editorship of I. E. S. Edwards, G. J. Gadd and N. G. L. Hammond. In order that the revision should be made available to readers as soon as possible, it is being issued in the first instance in fascicles. With some exceptions the fascicles will contain one chapter, but the order of publication will not correspond with the ultimate sequence of chapters. The first two fascicles have now appeared, namely *Troy*, by C. W. Blegen, and *The Religion and Mythology of the Greeks*, by W. C. K. Guthrie (the former priced at 3s. 6d. and the second at 6s.). This is an excellent idea and one that could be taken up by all sorts of organizations and editors. The fascicle idea is one many of us have recommended to the Royal Commissions on Ancient and Historical Monuments.

But merely revision of *The Cambridge Ancient History* is not enough. The sixty-five years that have elapsed since Lord Acton accepted the Syndicate's invitation has seen the enormous development of prehistoric archaeology. What is now needed is a *Cambridge Prehistory*.

## TWO RADIOCARBON DATES FOR THE KISALIAN

Pending the publication of a most important paper by J. Desmond Clark[1] on the radiocarbon succession in Central Africa, it was thought interesting to give two more dates which may be important for the age of the protohistoric cultures in the Congo Republic (ex-Belgian).

As has been described elsewhere,[2] the Kisalian culture was first isolated as a separate unit in the complex picture of Central African protohistory, as the result of excavations carried out at Sanga (terr. Bukama, Katanga) in 1957. Very little charcoal was found, and the C14 measures were taken from two skeletons. The samples were treated by the C14 laboratory, Physikalisches Institut, Bern University.

1. *Burial No.* 10

B-264 1070 ± 200 (= A.D. 880 ± 200). No pottery was found, but the metal objects discovered in this grave are similar to the material from other graves containing typical Kisalian pottery.

2. *Burial* No. 18

B-263 1240 ± 120 (= A.D. 710 ± 120). The grave goods include typical Kisalian pottery, iron and a necklace made of ostrich-shell beads.

Considering the overlap in those two dates, it would seem that the 8th to 9th centuries A.D. may be considered as the period of the Sanga necropolis occupation. Two other dates are interesting here:

(1) One in the Kalambo Falls series[3]: L-395B 1080 ± 180, roughly dating at least one stage in the Channeled Ware culture, and

(2) Bambandyanalo (Transvaal)[4]: Y-135-17 900 ± 65, pre-Bantu site related to the Zimbabwe complex.

J. NENQUIN

[1] In the *Proceedings of the IVth Panafrican Congress on Prehistory and Quaternary Studies* (Léopoldville 1959); to be published by the Musée royal de l'Afrique centrale at Tervuren.

[2] J. Nenquin, 'A New and Enigmatic Culture Discovered in Belgian Congo: Uncovering a Protohistoric Necropolis in Katanga', *The Illustrated London News*, vol. 233, no. 6225, 516–518 (27 September, 1958). *Id.* 'Une collection de céramique kisalienne au Musée royal du Congo belge', *Bull. Soc. roy. belge d'Anthrop. et de Prehistoire*, LXIX, 1958, 151–210.

[3] Radiocarbon Supplement, *American Jnl. of Science*, I, 1959, 24.

[4] *Id.*, 169.

## NEW RADIOCARBON DATES FOR AUSTRALIA

Following Mr Mulvaney's article on 'Australian Radiocarbon Dates' (ANTIQUITY for 1961, 37), readers may be interested in two new dates for carbon samples from a rock-shelter site near Grafton, on the north coast of New South Wales. This site, overlooking the River Clarence, contained stratified occupation deposit sloping out to a depth of 5 ft. at the entrance to the shelter, and was excavated in 1960 and 1961 by a team from the History Department of the University of New England under the writer's direction. In both years carbon samples were collected, and the two taken in May, 1961, both of charcoal, were analysed in September by the Institute of Applied Science of Victoria in Melbourne.

The first of these samples (Laboratory number O 17, International V 10), from layer two of that part of the deposit inside the shelter itself, a layer containing a quantity of charcoal, animal bones, and among the stone material microliths in chert and flint, gave a date of A.D. 1040 ± 80. The second sample (Laboratory number O 18, International V 11) taken from layer three of the deposit outside the shelter gave the very early date of 1920 B.C. ± 120. This sample was associated with uniface pebble tools, and other large flaked implements, whose chronological position has been the subject of much discussion, and for which a radiocarbon date will be of great interest. This date also provides our earliest evidence for human occupation in this part of Australia. Both dates provide chronological landmarks for the prehistory of northern New South Wales, and for the uniface pebble and microlithic industries in this region, an area in which there has been as yet very little archaeological work.

ISABEL MCBRYDE

## PREHISTORIC AND ROMANO-BRITISH ANTIQUITIES IN THE BRITISH MUSEUM

*Mr Bruce-Mitford, Keeper of British and Medieval Antiquities in the British Museum, sends us the following note:*

Before the war, the Prehistoric Room at the British Museum stretched across the head of the Main Staircase. This comprised, to the left of the stairs a large North Wing; the Central Saloon, and (to the right) a small South Wing. On the far side of the Central Saloon was the Roman Britain Room. All these galleries, with the exception of the South Wing, were severely bomb-damaged or destroyed. The South Wing now houses the display of Palaeolithic and Mesolithic Antiquities. A temporary corridor has been built through the centre of the old Central Saloon, carrying Romano-British antiquities in alcoves: it leads through into the old Roman Britain Room, in which the present display of Prehistoric and Romano-British antiquities is housed, and gives access to the South Wing.

The rebuilding of these galleries by the Ministry of Works is due to begin next year, 1962. The Main Staircase will be closed during the substantial reconstruction of the galleries. Plans include the provision of a well-appointed Students' Room, carefully designed accommodation for Reserve Collections, a new set of offices opening off the North Wing to house the staff of the projected Department of Prehistoric and Romano-British antiquities, and new and enlarged displays on modern lines.

The substantial rebuilding envisaged will take several years, and the new arrangements cannot probably be completed before 1965 or 1966. The commencement of the programme in 1962, however, will involve the closing down of the present displays fairly early in that year. Arrangements have been made for the exhibition of Prehistoric and Romano-British antiquities elsewhere in the building during the rebuilding period. The pre-War Early Christian Room on the upper floor, at one end of the Chinese Room, will be opened in the near future with an exhibition of 'star pieces' (such as the swimming reindeer from Bruniquel, the Folkton chalk idols, the Iron Age shields, the Mildenhall treasure, etc.). These relatively few select pieces will thus remain on exhibition throughout. A more general and representative exhibition of the Prehistoric and Romano-British collections will be displayed in a corridor down the middle of the pre-war Iron Age Gallery. The work involved in mounting this display cannot begin until January, 1962, and it is unlikely to be on view before July, 1962. When it is ready, however, the exhibition space for prehistoric and Romano-British antiquities will actually be a little larger than has been

available hitherto since the war. From the point of view of students there will inevitably be a period from after Christmas of this year until the opening of the temporary exhibitions in about July, 1962, when the bulk of the exhibits now on view will not be displayed. Students may like to know that throughout this period the material will be available for study, although for the first three months or so, when the rebuilding of cases is going on in the Iron Age Gallery, it will probably be necessary to give some notice if the objects are to be immediately available when the student calls.

## THE COURTYARD-HOUSE SITE AT HIGHER BODINNAR, SANCREED, CORNWALL: AN EARLY PLAN

The accompanying plan (FIG. 1(1)) shows the prehistoric village of the courtyard-house type, now completely destroyed, which formerly existed at Higher Bodinnar in the Parish of Sancreed, Cornwall (Nat. Grid S.W. 415323). It is by Thomas Tonkin (1678–1742), the Cornish antiquary and historian, and is inserted in vol. II of his MS *Parochial History* compiled in the period 1700–1736 and now preserved at the Truro Museum. This makes it the earliest known plan of any village of courtyard-house type (as distinct from a single house) by well over a century,[1] and the writer was advised, in view of the rarity of early site-plans, that it merited more than local publication.

The site was situated on the south-east slope of a granite hill, about 600 ft. above sea level and about 4 miles north-west of Penzance. It was one of about thirty sites of this type which exist, or are known to have existed, all of them in West Penwith—the Land's End Peninsula.[2]

Tonkin's plan shows two typical courtyard-houses, A and B, which he states were actually further apart than as shown, and to the south a very complex structure or series of structures (C) at the end of which (D) was 'Entr. to . . (obliterated) which is suppos'd to go through all these walls, but is now ruin'd'. This is almost certainly the fougou or souterrain of the type found at several courtyard-house sites, but not limited to them or to West Penwith. Tonkin gives the name of the site at *Kyrellw Veer* (Cornish for 'great ruin')[3] and its length as about 400 paces. He says that the structures were built of great stones and varied in height from 1 to 3 yd., and that the large jamb-stones were generally *in situ* at the entrances to the 'cellules'.

The only other 18th century record of the site is that of William Borlase, who visited it in 1738 and 1752.[4] He described the fougou, or Giant's Holt, as a partial ruin, of which he could only trace 20 ft., at the south end of an area of irregular overgrown ruins, almost certainly Tonkin's structure. C. Borlase also described and planned the Crellas, a monument of regular appearance consisting of two contiguous circles, the larger having a double wall with intervening ditch. This structure was also planned and described in the 19th century by R. Edmonds[5] and by William Borlase's descendant W. C. Borlase,[6] who partly excavated

[1] J. T. Blight published a plan of Chysauster in 1861 (*Arch. J.*, xviii, p. 39).

[2] For these Romano-British sites see F. C. Hirst, *J.B.A.A.*, 1937, p. 71.

[3] Cor. CRELLAS, pl. CRELLOW, rough hut or ancient ruin; MÛR, by mutation VÛR, great. An early 17th century survey mentions 'Crelow Comons' at Higher Bodinnar (Henderson MSS, Truro Museum, HC/25/19).

[4] *Antiquities of Cornwall*, 2nd edn., 1769, pp. 206, 292.

[5] *Trans. Penzance Nat. Hist. & Ant. Soc.*, I, p. 247 (1848); *The Land's End District*, 1862, pp. 45–48.

[6] *Naenia Cornubiae*, 1872, p. 259; *Arch. J.*, xxx, 1873, p. 327; MS notes, plans and drawings at Truro Museum.

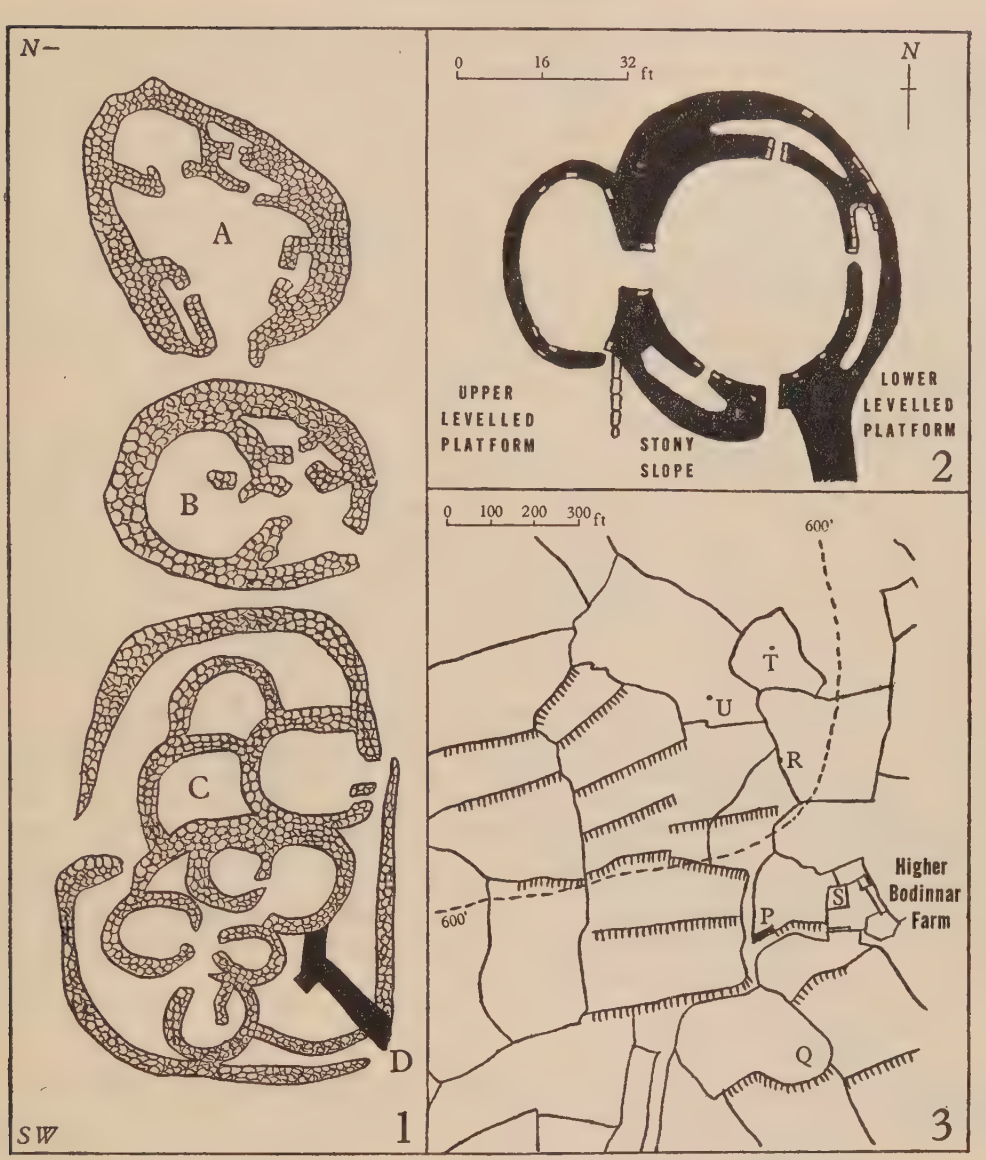



*Fig.* 1. *Courtyard-House site at Higher Bodinnar, Sancreed, Cornwall.* 1. *Plan by Thomas Tonkin.* 2. *Plan by William C. Borlase.* 3. *The Site:* 1961 (*showing ancient terraced field-system in modern fields*).

it in 1872; his plan is reproduced (FIG. 1 (II)) as being the least stylized and probably the most accurate. It seems that the structure was in fact the northernmost and best preserved of the courtyard-houses on the site, the smaller 'circle' being the round room and the double wall and ditch of the larger 'circle' being three long rooms leading off the courtyard. The question thus arises whether this house is identical with A, the northernmost house

on Tonkin's plan. This at first sight has little resemblance to W. C. Borlase's plan, but it in fact has the same sequence of round room, three long rooms, and entrance, and it is unlikely that Tonkin would have missed what seems to have been always the best preserved house. Tonkin's estimate of the length of the site as 400 paces may be compared with Edmonds's approximate half-furlong between fougou and planned house, and also with the 225 yd. shown on the Ordnance Survey between their presumed sites.

The history of the site after its discovery by Tonkin is a sad one of destruction by farmers, treasure-seekers and stone-robbers. Prior to W. C. Borlase's excavation the fougou and most of the structures, including (he was told) two 'bee-hive' huts with lintels over the doors, had been demolished. Two hoards of Roman coins had been found, one during the demolition of a hut and the other beneath the lane leading to the site, the latter including coins of Tetricus junior, Victorinus and Probus; earlier, coins of Carausius had been found 'at Bodinnar'.[7] W. C. Borlase's site plan is unfortunately not extant.

During the present century the destruction of the site has been completed. The stone from the village has been built into the modern field walls, which are in places very massive indeed. The ancient field terracing, typical of these sites, remains, and a depression about 55 ft. long and strewn with stones which is presumed to be the site of the fougou (P on FIG. 1 (III)). At Q are indications of a levelled circular enclosure or 'round', which may may be that noted by Edmonds, who found a large rim sherd there. At R is a cupped stone built into the hedge, and at S in the farm garden six large beach boulders such as are often found at these inland sites. The Ordnance Survey marks the site of one of the coin finds in the lane immediately west of P, and at T that of a 'Chamber Hut', probably the house planned by the Borlases and Edmonds. C. G. Henderson (*c.* 1914) saw a very ruined courtyard-house at U.[8] This had gone by 1936, when F. C. Hirst visited the site and found only the beach boulders, part of a mortarium, and a few other used stones around the farm premises.[9] There seems no evidence to support his division of the site into two, North Bodinnar (the 'Chamber Hut') and Higher Bodinnar (the fougou).

In conclusion, it should be noted that there was another courtyard-house site, mentioned by Edmonds, W. C. Borlase and Hirst, at Bojuthno on the eastern slope of the same hill. It apparently consisted of one house only, and has likewise been completely destroyed; its exact position is not known, but it was apparently between 170 and 300 yd. east of T.

The writer is grateful to Mr H. L. Douch and Miss V. Russell for their kind help with this note, and Mr A. C. Thomas for his advice.

P. A. S. POOL

[7] J. Buller, *St. Just*, 1842, p. 80.
[8] Henderson MSS, Truro Museum, *Antiquities*, I, p. 37.
[9] Hirst, loc. cit.; *Proc. West Cornwall Field Club*, 1936, p. 15; *ibid.*, 1937, p. 13; also MSS at Wayside Museum, Zennor.

## THE ADMINISTRATION OF ROMAN BRITAIN

Among the dioceses into which the later Roman empire was divided Britain has produced the least evidence for the precise whereabouts of its constituent provinces. But the picture is perhaps not quite so dark as it seems.

The Verona List shows that in A.D. 312–314 there were four provinces in Britain.[1]

[1] The Verona List was shown to date between A.D. 312 and 320 by A. H. M. Jones in *J.R.S.*, XLIV, 21–29. A further inscription shows that before the end of 314 the province of Numidia had been re-united. This is C.I.L., VIII, 18905, set up in Constantine's ninth *trib. pot.* by *Val. Paulus v.p.p.p.N.* Since the Verona List gives two Numidias it must have been composed before the end of 314, and hence in 312–314.

An ecclesiastical list dating to A.D. 314 gives the names of the delegations from Britain, Gaul, Spain, Italy and Africa which attended the Council at Arles in that year.[2] Delegations appear from five of the provinces of the diocese of the Gauls. Four provinces were each represented by one bishop (or his appointees) only.[3] A comparison with the *Notitia Galliarum*[4] shows that in each case the bishop (or his appointees) came from the Metropolis, that is, the capital of the province. (The ecclesiastical provincial organization is normally identical with that of the secular authorities). The fifth province, Lugdunensis Prima, was represented, exceptionally, by two delegations, that from the capital Lugdunum being supported by another from Augustodunum. The reason is perhaps the greater importance of this province, or possibly merely the fact that it was no great distance from Arles.

The same pattern does not, it is true, emerge from the dioceses of Viennensis or the Spains. There were naturally a large number of delegations from Viennensis, in which Arles was situated, while from the Spains the Metropolitan delegations were accompanied by others. But the pattern visible in the diocese of the Gauls is probably relevant for comparison with Britain, since circumstances in Gaul and in Britain are likely to have been similar. For Britain the list runs:—

Eborius episcopus de civitate Eboracensi provincia Britannia.
Restitutus episcopus de civitate Londiniensi provincia suprascripta.
Adelphius episcopus de civitate colonia Londiniensium.
Exinde Sacerdos presbyter, Arminius diaconus.

This part of the list has obviously been written in a very careless manner. There is no attempt here to indicate provinces correctly. But in the case of Sacerdos and Arminius it seems very probable that they formed a fourth delegation, their bishop being for some reason unable to attend—just as the absent bishop of Tarraco (the Metropolitan bishop of Tarraconensis) was represented by a priest and a deacon.[5] Unfortunately there is no indication of where Sacerdos and Arminius came from, but it seems reasonable to suggest that one delegation came from each of the four provinces, and also, in view of the evidence from the diocese of the Gauls, that each came from the Metropolis of its province. This will suggest that York, London and Lincoln[6] were the capitals of three of the British provinces.

While Britain was still one undivided province, that is in the 1st and 2nd centuries,

[2] Mansi, *Conciliorum Nova et Amplissima Collectio*, II, 476–477=C. H. Turner, *Ecclesiae Occidentalis Monumenta Iuris Antiquissima*, Tome I, Fascicule II, Part II (1939, ed. Schwartz), 396–415. The significance of this evidence was first pointed out to me some years ago by Dr J. P. C. Kent, when we attended Mr Browning's classes on the language of the early Church Councils, at University College London.

[3] The provinces of Germania Prima, Maxima Sequanorum and Alpes Graiae et Poeninae are for some reason not recorded at all. (The provinces of Lugdunensis Tertia and Quarta of course did not yet exist in A.D. 314.)

[4] Conveniently accessible in Seeck's edition of the *Notitia Dignitatum*, 261–274.

[5] Each bishop attending this council was specifically allowed the use of the *cursus publicus*, along with two assistants 'of the second rank' (Eusebius, *Hist. Eccl.*, x, 5, 23). But the *exinde* seems clearly to separate Sacerdos and Arminius from the preceding bishop, as comparison with the wording of other parts of the list shows: its seems merely to mean 'also from Britain'. (Only one bishop from the diocese of the Gauls had more than one assistant.) The text quoted is that of MS C, apparently the most reliable. For what it is worth, other traditions read *Sacer episcopus* for *Sacerdos presbyter*.

[6] *Londiniensium* is no doubt a dittography from *Londiniensi*. This would be most likely to happen if the original were *Lindensium*. If, however, the reference was really to Camulodunum, most of what follows will still be valid.

it is clear that London was its capital.[7] An important piece of evidence to support this does not seem to have been noticed. This is C.I.L., VII, 24, from Blackfriars,[8] a tombstone of a *speculator* of *II Augusta* erected by a group of individuals, one at least of whom was also a *speculator*. These officials were formally enrolled in legions, and the legion is often mentioned, but they never served at legionary stations. They had judicial duties (they acted, for example, as executioners[9]) and thus always served at provincial capitals. If one died while still serving, then the most likely place for him to be buried, and for another *speculator* to be concerned with his burial, was the provincial capital.

According to Herodian,[10] Britain was divided into two provinces immediately after the defeat of Albinus in 197. During the next fifteen years or so the precise form of the division is uncertain.[11] But from about A.D. 213 it can be shown that the boundary ran from the west coast north of Chester to somewhere on the east coast south of Lincoln,[12] the southern province, Britannia Superior (Superior meaning merely nearer to Rome) quite certainly retaining London as its capital. The capital of the northern province was apparently York.[13]

The two provinces became four under Diocletian. It is reasonable to expect that London and York will have continued as the capitals of two of the provinces. The four provinces were grouped in the diocese of the Britains, and London clearly became the chief administrative centre of the diocese. It was here that the *praepositus* of the diocesan treasury was stationed.[14] Now from the time of Constantine certain provinces were promoted in status by being given a senatorial *consularis* as governor instead of an equestrian *praeses*.[15] The first province in a diocese to obtain a *consularis* as governor was normally the province which had as its capital the chief administrative centre of the diocese:—

| *Diocese* | *Administrative centre* | *Province of which this was capital* | *First province of diocese with* consularis *as governor* |
|---|---|---|---|
| Oriens | Antioch | Syria | Syria (*Cod. Theod.*, XI, XXXVI, 7–8) |
| Pontica | Nicomedia | Bithynia | Bithynia (I.L.S. 1228) |
| Macedonia | Thessalonica | Macedonia | Macedonia (*Consultatio* 9, 7 with *Cod. Theod.*, II, i, 5) |
| Dacia | Serdica | Dacia Mediterranea | Dacia Mediterranea (*Not. Dig. Or.*, I, 77) |
| Pannoniae | Sirmium | Pannonia Secunda | Pannonia Secunda (I.L.S. 1253 with 756) |
| Galliae | Treveri | Belgica Prima | Belgica Prima (*Ann. Ép.*, 1955, 150) |

[7] The tombstone of Classicianus is the clearest indication that London was also the seat of the procurator.

[8] R.C.H.M., *Roman London*, 173, no. 14 and plate 61. No. 15 (fig. 76 and plate 60) in the same volume is the tombstone of a legionary centurion: the roll which the figure on the stone holds in his left hand may well indicate that he was *princeps praetorii*, the head of the governor's staff.

[9] *Acta proconsularia* 5 (*Corp. Script. Eccl. Latin.*, III, 3, p. cxiii). For these officials, cf. Domaszewski, *Die Rangordnung des römischen Heeres*, 33; A. H. M. Jones, *J.R.S.*, XXXIX, 44–45.

[10] III, 8, 2.

[11] The best discussions of this thorny problem are those of Eric Birley in A.A.[4] XI, 127–137 and C.W.[2] LIII, 52–62.

[12] E. Birley, A.A.[4] XI, 131–133, gives the relevant evidence.

[13] C.I.L., XIII, 3162. For the date, cf. *J.R.S.*, XXVII, 247, no. 7.

[14] *Not. Dig. Oc.*, XI, 37.

[15] A. H. M. Jones, *J.R.S.*, XLIV, 28–29.

The evidence from the other dioceses is not so clear,[16] but the general rule seems to apply. Of the four British provinces of the early 4th century, Maxima Caesariensis alone had come to be governed by a *consularis* by the time of the *Notitia Dignitatum*. Presumably London was the capital of Maxima Caesariensis.

Since the Britannia Prima of the 4th century must have occupied some part of the area of the Britannia Superior of the 3rd century, and since Britannia Superior covered south and west Britain, then since the London area constituted Maxima Caesariensis, Britannia Prima must have covered Wales and part at least of the west country. The Cirencester dedication[17] strongly implies that that city was in Britannia Prima. For although the one reason for which a governor was allowed to leave his province was to make a dedication,[18] it is clear that the Cirencester dedication was set up in the governor's own province, for in the formal prose dedication the governor's province is not specified, as it certainly would have been if he had been dedicating in a province not his own. (The mention of the province in the verse dedication clearly has no force.) Cirencester must therefore have been in Britannia Prima. The size and wealth of the city suggest that it was the capital. (In that case it will have been the bishop of Cirencester that Sacerdos and Arminius were representing at Arles.)

Of the two northern provinces, that of which York was the capital probably had its southern boundary approximately on the Trent-Mersey line. For under Diocletian the *praeses* of this province was clearly also still the military commander.[19] The whole of the military area of the north must then have been included in the province, in order to ensure unity of command. Thus its southern boundary can hardly have lain much to the north of the Trent-Mersey line, and it is unlikely to have been altered later, when the military command of the north was assigned to a *dux*. Therefore the Lincoln province, unless it were improbably small, must have lain mainly to the south of Lincoln. The title *comes litoris Saxonici per Britannias*[20] implies that this command extended over more than one of the British provinces. It is unlikely that the western boundary of Maxima Caesariensis reached the sea to the east of Portchester, and so it was presumably some of the northern forts of the Saxon Shore that fell in another province. Thus the Iceni (and presumably also the Coritani) will have lain in the Lincoln province.

The object of the subdivision of provinces under Diocletian was administrative convenience, the reduction of the burden on individual governors. Administrative coherence and ease of communication would be the main factors to be considered. It is true that over much of their length the boundaries of Professor Hawkes's Iron Age provinces[21] approximate quite closely to those implied by my arguments for the provinces of

[16] The development was necessarily somewhat different in the dioceses of Asia and Africa, where the proconsular provinces introduce a complication. In the diocese of Thrace the presence of Constantinople gave the province of Europa predominance, cf. A. H. M. Jones, *J.R.S.*, XLIV, 27–28. The rule applies to the diocese of Viennensis whether Arles or Vienne was the centre for the diocese (both were in the province of Viennensis, the first to receive a *consularis*, I.L.S. 1279) and to the diocese of the Spains, if the administrative centre was in Baetica (under a *consularis* by A.D. 357, *Cod. Theod.*, IX, xlii, 3, cf. C.I.L., II, 2206).

[17] E.E. IX 997 = I.L.S. 5435.

[18] Digest I, xviii, 15.

[19] *J.R.S.*, XIX, 214 = C.W.[2] XXX, 200.

[20] *Not, Dig. Oc.*, I, 36 and V, 132.

[21] ANTIQUITY, XXXIII, 170–182 = *Problems of the Iron Age in Southern Britain* (ed. S. S. Frere), 1–16.

the early 4th century,[22] but I doubt very much whether this is anything more than coincidence.

ADDENDUM: a *consularis* of Dacia Mediterranea dating to A.D. 364–7 is attested by an apparently unpublished inscription which I read at Skopje in September.

J. C. MANN

[22] I have no new suggestion to make here on the problem of Valentia, the new province created in A.D. 369, but two points may be noted. (1) The pottery evidence (J. P. Gillam, *Carnuntina* (Römische Forschungen in Niederösterreich, Band III), 76 and map 10) ought now to kill finally the lingering notion that it lay to the north of Hadrian's Wall. (2) The title *dux Britanniarum* (as is clear from a study of 4th century titulature) implies that by the time of the *Notitia Dignitatum* his command covered more than one province, whereas, as argued above, at the time of the transfer to a *dux*, the command covered only one province. This suggests a subdivision of the early 4th century York province.

## MEDITERRANEAN SCHOLARSHIP, 1962

The Society for Hellenic Travel is again offering a free place on a Mediterranean Cruise in 1962 to a student member of the Society interested in the history, archaeology or art of the Mediterranean. This award will be based on an essay submitted on any subject concerning the history, civilization or art of the Minoans, the Myceneans, the classical Greeks, the Roman Republic and Empire or the Byzantine Empire. Applicants should be between the ages of sixteen and twenty-one, in the sixth form at school or in the first year of their University studies. The essay should be of approximately 3000 to 3500 words and should not include any illustrations, maps, plans or diagrams. It should be sent in by 15 February, 1962, but candidates should get in touch immediately with *Miss M. W. McCall, Secretary, Society for Hellenic Travel, 4, Argyll Mansions, Chichele Road, London, N.W.2.* The 1961 Mediterranean Scholarship (ANTIQUITY, 1960, 300) was awarded to David Whitehouse, a first year undergraduate at St. John's College, Cambridge, reading Archaeology and Anthropology.

## NOTES AND NEWS FOR MARCH 1962

Pressure of space has forced us to delay publication in this number of several interesting features, which will appear in our first number next year. These include:—

'Settlement Patterns in Celtic Britain' by Leslie Alcock. Mr Alcock takes issue with Mr Glanville Jones ('Settlement Patterns in Anglo-Saxon England', ANTIQUITY, 1960, 221) over his interpretation of the archaeological evidence.

'The Villa in Roman Britain', by W. H. Manning. Mr Manning pleads for an exact connotation for the word 'villa' in the archaeology of Roman Britain.

'The Chateaumeillant Conference'. Mrs M. A. Cotton reports on the Second *Colloque International d'Etudes Gauloises, Celtiques et Protohistorique* held at Chateaumeillant, in July, 1961.

# Reviews

WORLD PREHISTORY—AN OUTLINE. *By* GRAHAME CLARK. *Cambridge: University Press*, 1961. *pp.* xvi + 284, *frontispiece and* XII *plates*, 7 *maps.* 15*s.*; $2.45.

In this handsomely printed paperback, J. G. D. Clark, Disney professor of archaeology at Cambridge has, with intrepidity, attempted the impossible and come off rather well—all things considered. Granting the word 'outline' in the title, Clark delivers a world prehistory. He begins at the beginning (the primates) and goes on until the death of Ivan III (1505), Cortés' (1519–1521) and Pizarro's (1532) conquests and Captain Cook (1768–1779). Clark's preface indicates clearly that he knew what he was getting into; he '. . . trusts that where his interpretation differs without explanation from that of some authorities cited at the end of this volume, the nature and limitations of his book will be remembered'. He adds that '. . . even an imperfect text may have its uses, more especially to those prepared to adventure more widely in the literature of the subject', and the approximately 300 items in the bibliography invite this adventure.

No conscientious and fair reviewer with any comprehension of what is involved—and properly disarmed by Clark's preface—could do other than admire this attempt. Nevertheless, the scope is so vast, the procedures in field research and interpretation are so varied in even the up-to-date sources which Clark draws upon, the level of *known* is so variable, that the result is bound to lack a certain cohesion and neatness. Perhaps wisely, Clark has elected to be mainly descriptive; he neither asks nor worries over very many *how* or *why* questions (although he does, by implication, now and then answer a few—not always correctly, to this reviewer's taste). The resultant tone of the book is thus encyclopaedic and hence also necessarily a bit soporific. Clark's maps are clear and useful; his half-tone plates are good, but show a distinct preference for sculpture and relief and are evidently mainly for decorative purposes.

Clark is naturally at his best and most detailed on European prehistory (insofar as this only faintly encyclopaedic reviewer can judge), and it is also here that his well-known ability to correlate cultural and environmental phenomena shows to greatest advantage. But direct extrapolation of generalizations from the north temperature zone into the semi-arid zones is not so easy. For example, Clark generally uses 'Neothermal' instead of 'Recent'—in a world-wide sense—for the post-Pleistocene period; this is evidently coupled in his mind with such generalizations as '. . . a reasonable hypothesis that the domestication of animals and plants was carried out under the stress of the arid conditions that followed immediately on the end of the last Pluvial period in parts of western Asia' (p. 64). Some of the authorities Clark cites have, of course, argued the point that there was no such significant climatic change in south-western Asia; recently Raikes and Dyson (*Am. Anthrop.*, 61:265, 1961) have questioned this same sort of generalization as utilized by Clark (p. 180) for Baluchistan. Seen from some portions of the world, 'Neothermal' may carry implications of generality and of environmental determinism with which this reviewer cannot agree.

Both his text and the variety of sources he cites suggest that Clark is least at home with the problem of the appearance of urban civilization. The recent Oriental Institute 'urbanization symposium' (Kraeling and Adams, *City Invincible*, 1960) would serve to supplement

his treatment, especially Adams's essays, *inter alia* depressing the importance of irrigation in ancient Mesopotamia. Students considering Clark's final 'Retrospect' chapter would also be stimulated by Redfield's *Primitive World* (1953) and some of Julian Steward's essays.

As an aside regarding his own field specialty, the reviewer was slightly disgruntled to find the description of Karim Shahir and Jarmo based upon the publication of a pair of 1952 lectures, although 1959 and 1960 sources are cited. Clark could certainly have predicted that any specialists would complain, however.

It comes to this then; this reviewer knows of no other book on prehistory which offers the world and then proceeds to deliver it even in outline form. The outline thus provided will be a useful one for some time to come, even if some of its detailed generalizations call for second thought. If the textbook were absolutely perfect, what would the teacher's role be?

ROBERT J. BRAIDWOOD

PREHISTORIC INVESTIGATIONS IN IRAQI KURDISTAN. *By* ROBERT J. BRAIDWOOD and BRUCE HOWE, *with contributions by* HANS HELBAEK, FREDERICK R. MATSON, CHARLES A. REED, HERBERT E. WRIGHT, JUN. (Studies in Ancient Oriental Civilization, No. 31.) *Chicago: The University of Chicago Press*, 1960. *pp.* xxviii + 184, 29 *plates*, 8 *figures*. $5.

For some years Professor Braidwood has been primarily interested in investigating the evidence for the transition from man's food-gathering and mainly cave-dwelling stage to that of the earliest settled village-farming communities. His many stimulating articles have made him the leading authority on this subject, which is receiving, under the impetus of his work, increasing attention throughout the Middle East. Braidwood has always favoured the 'hilly flanks of the Fertile Crescent' as what he terms a 'natural nuclear area' where it was reasonable to expect this transition to have taken place; 'nowhere else in the world were the wild wheats and barley, the wild sheep, goats, pigs, cattle and horses to be found together in a single natural environment', and the known early village sites, few though they were, fell strikingly within this zone. For these reasons he chose Iraqi Kurdistan as a fruitful ground for research, and this book, the first extensive account of his work, incorporates the results of his first three seasons there.

The first season (1948) included excavations at Matarrah near Kirkuk, where material comparable with that from Hassuna was discovered, and a sounding at Jarmo in the Chemchemal plain which revealed a settled village site typologically earlier than the Hassuna phase. In the second season (1950–1951) extensive excavations were carried out at Jarmo and the staff was enlarged 'so that work on the general problem could be extended to include investigation of the archaeology of the final phases of cave occupation in the zone of foothill and intermontane valleys, and a search for open-air sites which might have been occupied during the interval between the cave phases and the Jarmo phase'. Karim Shahir, an open air site, was excavated, and soundings were made in a rock shelter called Palegawra, which revealed Zarzian material, and at the Middle Palaeolithic site of Barda Balka. In 1954–1955 the survey was greatly extended, the participation of natural scientists increased, and a number of soundings carried out at promising sites. In the spring of 1955 excavations were resumed at Jarmo and by Howe at Palegawra. This extensive programme has produced a vast and extremely valuable body of material, extending in time from the Middle Palaeolithic food-gatherers of Barda Balka through the developed Mousterian horizon in the caves, the Zarzian 'food-collectors', the open-air sites of 'incipient cultivation' like

Karim Shahir, to the village farming communities of Jarmo and the subsequent Hassuna and Halaf phases.

The first part of the book includes a discussion by Braidwood and Howe of the general problem and of the Iraq-Jarmo Project's field activities, a geographical description of the region, a description of the sites, twenty-four in all, and an account of the various archaeological assemblages. Then follows a group of specialist articles by the various scientists associated with the expedition. There is a useful note on specialized ceramic studies and on C14 techniques by F. R. Matson. This incorporates a disappointingly small number of radiocarbon dates from the fifty-two samples obtained by Dr Matson from a number of excavated sites throughout the Near East, but one can sympathize with his reluctance to submit irreplaceable specimens to analysis until the problems of contamination are better understood and controlled. H. E. Wright, Jun., has written a detailed chapter on Climate and Prehistoric Man in the Eastern Mediterranean which includes Pleistocene and post-Pleistocene material from the Levant to Iran. One of his most significant conclusions is that on the basis of the present evidence there is not necessarily a cause and effect relationship between climatic change and the transition to food production. A study of great importance to the Jarmo project, and of great value to archaeologists in general, is H. Helbaek's chapter on the palaeoethnobotany of the Near East and Europe. Both this and C. A. Reed's very informative contribution on the domestication of animals present the available data in detail and provide a welcome source of reference to this often recondite material. A minor point of irritation in Helbaek's otherwise admirable chapter is the unfortunate misuse of conventional geographical terms—'Kurdistan' to refer to Northern Iraq and 'Mesopotamia' to refer to the south (p. 100), and a reference to Tell Brak 'in the Kurdish foothills' (p. 115). Reed's article abounds with probably well-deserved censure of archaeologists who have neglected, intentionally or otherwise, the zoological evidence unearthed in their excavations. But it should be emphasized, as he himself admits, that it is not always easy to find a zoologist who can or will identify animal bones from remote parts of the world, and also that present facilities are far superior to those available to many earlier excavators whose omissions he criticizes. The Jarmo expedition was indeed fortunate in being able to afford the services of an archaeological osteologist on the site. The final chapters of the book include one on chronology, one by Reed and Braidwood on a reconstruction of the environmental sequence of North-eastern Iraq (incorporating some of Solecki's unpublished material from Shanidar cave), and finally an informative and stimulating comment entitled 'observations, questions and prospects'.

Altogether this is an extremely useful volume, and the mass of information it contains is a tantalizing foretaste of the fully documented excavation reports which are yet to come: the full publication of vital sites like Jarmo and Karim Shahir, of Banahilk north of Rowanduz from which we are promised, in spite of the restricted area of the test trenches (70 sq. m., of which about half yielded unreliable material), the first full-bodied description of the total archaeological assemblage of a Halaf site. The excavations at Matarrah were of course published some years ago (*Journal of Near Eastern Studies*, 1952), but even here some of the conclusions need revision in the light of new evidence. One most important fact, for example, is that Braidwood no longer considers that Baghouz and Samarra represent simply further variants of the 'standard' Hassuna assemblage, and the question of the existence of a distinct 'Samarra' assemblage is again open (pp. 37, 149, 162). The question of the relationship between Jarmo and Hassuna presents many problems, but it is to be hoped that the publication of the Danish excavations at Shemshara, near Rania, where Jarmo-like materials occur below the Hassuna-Samarra levels, may throw some light on this. In fact, when we consider how incomplete is our knowledge of the better-known prehistoric assemblages in

Northern Iraq, we can appreciate the great advance made by Braidwood and his team in filling what had previously been total gaps in our information. There are, of course, problems of which we must not lose sight just because they are apparently insoluble. Braidwood would probably be the first to admit that any account of the development of early agricultural communities based entirely on the evidence of small sites, available for excavation largely because they were not sufficiently attractive to later settlers, is a skeleton without a skull. An important, though at present unattainable, complement of evidence must lie at the base of the great tells such as Erbil, Kirkuk and Chemchemal, where the natural advantages which have encouraged continuous occupation might well have favoured a more complex development of the original community.

Professor Braidwood is very modest in his claims: 'the goal of understanding that we seek will not come within the lifetime of this expedition's staff' (p. 1). Nor does he 'conceive of Jarmo, or Karim Shahir, or the Chemchemal valley, or even the intermontane valley zone in Iraqi Kurdistan as *the* centre of this cultural initiation'; he simply believes that 'they lay within the general life-zone of the hilly-flanks nuclear area where the cultural initiation was made and that they participated in and probably contributed to its beginnings in a manner still properly to be determined' (p. 177). We are presented here with tentative results, pending the completion of laboratory research, but already a vast body of new information has been provided, and under the stimulus of Braidwood's ideas and high standards of research, similar investigations have been inaugurated in a number of surrounding countries. The problem of the 'appearance of the effective village-farming community', as Braidwood carefully terms it, is of obvious importance in the study of man's history, and we look forward to further and revised results not only from the Iraq-Jarmo Project, but also from Braidwood's expedition to Iran in 1959–1960. On this occasion the same senior staff undertook a similar investigation in the valley plains about Kermanshah, and it is clear from preliminary reports that the results reinforce the 'hilly-flanks' theory. It is particularly fortunate that Professor Braidwood is associated with an enlightened research university where the money and personnel for 'continuing intellectual commitment to a single research problem' are available. As he rightly points out, there are few archaeologists who have the good fortune to be able to devote themselves to such a task where the yield of antiquities is low. The inclusion of a number of natural scientists on the expedition staff has clearly been of great service both to the archaeologists and to themselves, and the value of their combined contributions is obvious throughout the book.

There are a few criticisms one can make. The most annoying feature of the book is the separation of the physical description of each site from the account of what was found there. The lack of an index is unfortunate and only partially compensated by a detailed table of contents, and the maps would be improved by the addition of a scale. But these defects are minor indeed. The volume itself is inexpensively produced and its very reasonable price will make it available to archaeologists and students alike; this is fortunate, since for both it will be a basic manual for years to come. And it is very refreshing to read the report of an archaeologist who candidly admits that not all of his ideas have produced the desired results.

JOAN OATES

THE DAWN OF AFRICAN HISTORY. *Ed. by* ROLAND OLIVER. *London: Oxford University Press. pp.* 103, 8 *plates*, 13 *maps.* 12*s.* 6*d.*

Lest anyone should be misled by the picture on the cover of the Nutcracker Man, let it be said straightaway that the Dawn is of the written rather than the unwritten record. There is little or nothing here about Africa in Palaeolithic and Neolithic times. True, Sir Mortimer Wheeler is given the task of filling the gap in a brief introduction entitled 'first

light' (can't prehistory develop some rationing system for some of these overworked similes?), but this bitty chapter is the flimsiest contribution of the lot, little influenced by recent work on the development of food production in Africa.

The next twelve chapters take the reader on a 'tour of pre-colonial Africa' conducted by as many different authors each taking a particular area. The last is an editorial finale which attempts to sum up "the African achievement'. Dr Oliver begins by bravely stating the case for a history which combines a study of documents, archaeology and culture. While many of the chapters are well done, Kwapong on Carthage, Greece and Rome, Huntingford on the Ethiopian kingdom of Axum, a number of lapses show that this remains a matter of programme rather than achievement. For example, the basis of Wheeler's classification of the African population is obscure, from the physical, linguistic and cultural angles. Then again the book is shot through with traces of the musty assumption that 'divine kingship' (whatever that may be) has diffused from Egypt.

And a similar archaic air pervades the editor's thesis that 'It was perhaps the greatest weakness of African monarchies that they never hit upon the principle of primogeniture, nor upon any other certain system of succession'. Comparative sociology would question most of the assumptions behind this statement; and European history itself would suggest that the rule by which the first-born succeeds the father was not an unmitigated blessing.

Leaving aside these particular questions, this book raises two general issues. Despite the noteworthy attempts they have made in the last few years, our historians of Africa are still bound too tightly to their European and Mediterranean backgrounds; African cultures are too easily seen as derivative and their institutions as inferior. I do not advocate the universal acceptance of the opposite standpoint, but historians need to look very carefully at their conceptual tools when dealing with anything except the material aspects of non-European societies.

One way of eliminating this Pinkie in the Woodpile is through a greater acquaintance with prehistory, ethnology and comparative sociology. The best historians of non-European societies are aware of the problem, but perhaps its root is to be found in the rigid boundaries of our teaching system, which too often provides an inadequate base for the study of other societies. Outside the natural sciences too many British scholars are just insufficiently acquainted with related studies and rest content to joke at transatlantic efforts towards 'cross-disciplinary fertilization'. But there are hopeful signs that the new Universities will do something to redress the balance of the old.

Meanwhile the dearth of general accounts of Africa's past is such that the appearance of this piecemeal volume is to be warmly welcomed; and it is short enough to tempt the most general of readers and be squeezed into the most crowded of six-form schedules.

JACK GOODY

THE SELJUKS. *By* TAMARA TALBOT RICE. (Volume 20 in the 'Ancient Peoples and Places' Series.) *London: Thames and Hudson*, 1961. *pp.* 240, 58 *figures*, 40 *plates*. 30*s*.

This is Mrs Talbot Rice's second book in the series, 'Ancient Peoples and Places', and it makes a worthy successor to *The Scythians* with which the series began. Since her first contribution there has been a spate of commissioned works by specialist authors, some well known and others whose names may now become increasingly familiar. This book one opened without misgivings and closed it with a genuine sense of gratitude to author, editor and publishers alike. Interest in the Seljuks has understandably increased during the past decade, but no comprehensive work on the subject had hitherto been written in the English language. Messrs Thames and Hudson have now filled the gap.

There are two historical chapters, the first of which deals with the background of Seljuk history up to the time when Alp Arslan inaugurated the conquest of Anatolia. And here of course we are first introduced to the 'Great Seljuks'—shadowy historical figures who loom rather more than life size in the heroic literature of the Turks; difficult to imagine as people, partly owing to the absence among their contemporaries of any capacity for portraiture, either artistic or literary. The suggestion of crudity which emerges from the bare facts of their recorded lives, is modified, even at this early stage by undoubted evidence of their interest in learning and belief in education; witness for instance Malik Shah's intimacy with the mathematician, Omar Khayyam and patronage of Nizam-al-Mulk, who helped him to found universities, hospitals and observatories. After their conquest of the Anatolian plateau, symptoms of enlightened statesmanship became even more pronounced in the 'Rum' dynasty of Sultans, whose history Mrs Talbot Rice records very fully, though their lives and individual accomplishments are possibly less significant and in some cases less interesting than the character of the Seljuk state to whose consolidation they all contributed. Its creation was in fact a first step in the long process whereby Asia Minor of the Greeks gradually came to be transformed into modern Turkey. But the accomplishment of the Seljuks was not only in laying the foundations of a united Turkish nation. In the author's own words:—

> 'When we pause to reflect on the tumultuous events of their own history, to assess their achievements in the administrative sphere, to gaze upon their works of art and study their literature, it becomes a matter of astonishment that so relatively small a group of nomads contrived in a space of some two centuries to carve a kingdom for themselves out of the territories of infinitely larger states, to endow it with a distinctive culture of its own and to inspire its people with a sense of nationhood which enabled them to emerge from the Mongol occupation with their spirit unbroken'.

In Mrs Talbot Rice's book, the policy and system by which all this was brought about emerges, not so much from the bare narrative of the historical chapters as from the sections which deal with the everyday life, thought and literature of the Seljuks. Though these too are dealt with in an entirely factual way and with unexceptionable objectivity, they contrive to evoke certain peculiarities of the Seljuk mentality, most congenial to Western taste: their strangely un-oriental liberalism and dialectical curiosity, contrasting with the empirical acumen of their practical politics. One sees, for instance some evidence of this already apparent in their treatment of the Anatolian peasantry after the conquest. One would expect to find that, where the population was predominantly Christian and the traditional administration Graeco-Roman, Moslem methods would have proved so uncongenial that their application would have required continual resort to force. On the contrary, the new regime appears actually to have brought some measure of economic relief, at least to the peasants. The Turks only required them to pay *haraj* or individual tax, and when this was understood, there was a general movement of Christian farmers back into the conquered territory, where they found themselves in a position to accept Islam for reasons of interest while retaining their own faith. At the same time, any suggestion that they remained passive victims of a barbarous autocracy is removed when one finds, for instance, a fraternity of 'guilds' sponsoring a movement towards social reform. In fact, the process of adjustment between Moslem conquerors and Christian subjects completed itself to everyone's satisfaction. The native population profited from tolerant treatment and the Turks themselves were increasingly influenced by the new social and philosophical ideas of this unfamiliar world.

Not all of this is sufficiently emphasized by Mrs Talbot Rice; nor for that matter is the

gradual penetration of Western influence among the Seljuks after the Crusades. Gordelevski, whose work appears in her bibliography [(Note: V. A. Gordelevski, *Gosudarstvo Seldjukidov Moloi Azii*, U.S.S.R. Academy of Science, 1941. It would perhaps have been worthwhile noting in the bibliography that a very full and interesting review of this book in English appeared under the name of I. M. Sayar in *J.N.E.S.*, x, 4, 1951)], mentions how the Turks even came to employ Latin feudal terms, such as 'baron', 'constable' and others. Thus Mongol, Armeno-Arabic, Byzantine and occidental influences and systems came together in Asia Minor. These in time fused on a ground of wide ethnical diversity and greatly influenced the social organization of the Seljuks. He also discusses some influences on the Seljuks of their contacts with the Crusaders themselves and the Seljuks' own possible contribution to the Western concept of chivalry.

Where one regrets such omissions in the earlier part of Mrs Talbot Rice's book, no fault can be found with the chapters on Seljuk art and architecture, which are admirably handled and testify to a diligent study of the monuments themselves. Once more her appraisal of them is restrained by a disciplined objectivity and their abstract charm is left to speak for itself. It would do so more eloquently if the photographic plates had been up to the standard of the text. Unfortunately the process of reproduction used in this case has resulted in a soft imprecision, curiously unflattering to the opulence of Seljuk enrichment. Incidentally, the absence of captions is at times irritating. (Having with difficulty found the number on Plate 7, one looks in vain for a note to the effect that the photograph of the Ince Minare at Konya was taken before the minaret itself was truncated by lightning.) The line-blocks on the other hand are excellent, though the sequence of ground-plans might perhaps have been varied, for instance by a diagram explaining the complexities of the 'Turkish triangle'. If one may add one further small complaint, the historical narrative might be served by a larger and more populous map. This might even have helped to avoid geographical enigmas in the text, such as—'the old military road spanning the Gök Su (Calycadnus) on its way to Dorylaeum (Eskişehir)' (p. 53), and 'in the pass of the Sultan Dag above Egridir' (p. 63).

But none of these minor criticisms detract from one's admiration for the distinction and intelligence with which this book is written and the thoroughness with which it is compiled. Perhaps one may hope for yet another title in the series from Mrs Talbot Rice.

SETON LLOYD

FILITOSA ET SON CONTEXTE ARCHÉOLOGIQUE DANS LA VALLÉE DU TARAVO. *By* R. GROSJEAN. (Volume 52 of *Monuments et Mémoires de la Fondation Eugène Piot* published by l'Académie des Inscriptions et Belles-Lettres.) *Paris*, 1961. *pp.* 96, 78 *figures*, 14 *plates*. NF24.

The Taravo Valley is the region of Corsica richest in prehistoric remains. Finds of Early Iron Age material are still lacking, and there is nothing in the area which can with any certainty be dated earlier than 2000 B.C. These periods, therefore, fall outside the scope of this monograph which limits itself to the study of one region of Corsica during the second millennium B.C. A large proportion of the book is taken up by a full account of the author's excavations at Filitosa, but detailed reference is also made to the dolmens and menhirs of the district and to the incineration tumulus of Musolo. As a result of his fieldwork and excavations, M. Grosjean is able to put forward a sequence of cultures which can be applied to Corsica as a whole.

In his period 'A' he places the megalithic cists, the dolmens, and the unworked menhirs. None of these monuments has yet produced dateable finds, and the earliest phase of the

megalithic culture is made up, by elimination, of material which cannot be shown to belong to any of the succeeding stages.

Period 'B' is represented by the evolved statue menhirs with weapons and human faces carved in relief. The author prudently avoids any attempt to date these figures by the arms they bear, and is content to refer them to the 'Bronze Age'. At Musolo, a plain menhir with a roughly carved head was originally present on top of a tumulus covering an area of burned clay on which some sort of incineration had taken place. The scarce potsherds from this site cannot be dated, and the chronology of this second period depends on the figure given to the culture of the "Torre" which marks Grosjean's period 'C'.

More than thirty of these constructions have been found in Corsica, but Filitosa is the most complex example to have been excavated and the only one to have preserved traces of occupation during period 'B'. The earliest structure at Filitosa seems to have points in common with the tumulus of Musolo, and broken statue menhirs were re-employed in the construction of the cyclopean walls of the 'torréen' monument.

The first fixed point in Corsican prehistory is provided by a C14 date of 1200 ± 100 B.C. from Filitosa which seems very reasonable, but this by no means solves all the chronological problems. The dating of the pre-torréen periods still depends on guesswork, as the author admits by including two alternative chronologies from which the reader can take his pick. Only the dates for period 'C' are common to both. A further confusion is introduced by the C14 dates of 2298 ± 110 B.C. and 1907 ± 130 B.C. from the 'torre' of Tappa, published in the June number of ANTIQUITY (p. 148). One hesitates to disagree with C14 dates, but these seem relatively too high. The long swords carved on the statue menhirs of the previous period are more developed than anything so far known from the West Mediterranean by 2000 B.C. The pottery from the 'torre' resembles in some respects developed nuraghic pottery of Sardinia and has in its elbow handles a further parallel in Sardinian Bunnanaro ware. Neither of these styles can be as early as 1900 B.C.—as the C14 date from Barumini proves! The date of about 1200 B.C. appears more suitable.

The author emphasizes that his scheme must be provisional and that it may need revision as more evidence becomes available. Many problems remain to be worked out. It may be possible to define more closely the relationship between the 'torre' and the rather similar monuments in Sardinia, Apulia, and the Balearics. The purpose for which the 'torre' were constructed is still unsure, and the reviewer would demand more evidence to convince him that they are funerary or ritual buildings. Time and further excavation will answer these questions. The most pressing need is to confirm the earlier part of M. Grosjean's sequence by the finding of dateable material *in situ*, and to tie in with his scheme the abundant pottery, stone, and obsidian finds from caves and rock shelters.

WARWICK BRAY

ACHAEANS AND HITTITES. *By* G. L. HUXLEY. *Oxford*, 1960. *pp.* 54. 5*s*.

There was a Greek Empire, politically and economically integrated, in the 13th century B.C.; its centre was Mycenae, whose king—overlord of other kings—is to be identified with the 'King of Aḫḫijawā' of the Hittite documents. Such is the principal theme of this essay; not in itself new, but presented here with vigour and freshness in a stimulating and useful discussion based on wide and deep learning.

The argument is, as it must be nowadays, twofold: negative, in answer to the gradually prevailing doctine that the Aḫḫijawā of the Hittite documents was a Mycenaean island-kingdom near the coast of Asia Minor; and positive, an attempt to find objective evidence enforcing the equation with a Mycenaean mainland-empire. The negative part scores some good points, without (I judge) winning the game. The case for an island (such as Rhodes)

rests primarily on the interpretation of the Tawagalawas-Letter. It has been held that the villain of the piece, one Pijamaradus, transferred himself and his family from Miletus to Aḫḫijawā, which he used as a base for attacks on Hittite-controlled provinces on or near the coast of Asia Minor; if so, that base was presumably near the coast of Asia Minor, certainly not so far away as the Greek mainland. Mr Huxley maintains that the phrasing of the Letter, though it proves that the family of Pijamaradus was taken to territory controlled by Aḫḫijawā, does not necessarily imply that this was the land in which the Aḫḫijawan king himself resided—it may have been a dependency. Much more important is the next point: that the Letter implies that, at the time of its writing, Pijamaradus himself was not in the same land as the King of Ahhijawā; so we lose our one firm foothold—we can no longer infer that, because Pijamaradus is based near the coast of Asia Minor, the land of his protector also, the Aḫḫijawan King, must lie near the coast. Mr Huxley's argument here deserves very careful consideration. If he is right, the case in favour of Rhodes loses a very strong point, and will henceforth rest on other more general arguments. It is to be stressed that the loss of this point would not at all diminish the general probability of an off-shore island (indeed, Rhodes has been much favoured by scholars who have made no use of the point which Mr Huxley attacks here); there is nothing in the Letter, either on Mr Huxley's interpretation or on mine, in the least inconsistent with a picture of the King of Aḫḫijawā in Rhodes, the Hittites in Miletus, and Pijamaradus scampering up and down in Masa or Karkija, as he had threatened to do. And it remains, I think, as hard as ever to make sense of the Letter as a whole if the Greek King to whom it is addressed is as far away as Mycenae.

We pass to the positive aspect. If the Hittite documents do not disclose the location of Aḫḫijawā, what other hope is there? None at all, I should say. Mr Huxley replies that 'Mycenean archaeology and Greek tradition can show where the king of Aḫḫijawā lived'. This I vigorously dispute. Archaeology and tradition can tell us much about the political and economic power of Mycenae; they will never enable us to answer the question at issue here, whether the King of Mycenae is to be identified in the Hittite documents. The evidence of archaeology and tradition is, and will always remain, perfectly consistent with the existence both of a mainland overlordship at Mycenae and of an independent settlement of prosperous and adventurous Achaeans at Rhodes, called Aḫḫijawā by the Hittites. Mr Huxley himself ultimately abandons his claim for archaeology: 'in the end it is Homer who provides the needed historical evidence . . . to prove that the chief king of the Achaeans was none other than the king of Aḫḫijawā'. There follows an interesting discussion of numerous topics—the date of the Trojan War; the Catalogue of Trojans in the Iliad; the League of Assuwa and the fascinating Chronicle of Tuthalijas the Fourth; the identification of Taruisa and Wilusija with Troy and Ilios; the Karabel sculptures. But—*evidence* that Homer's Lord of Mycenae is the same person as the Hittites' 'King of Aḫḫijawā'? Not a scrap that I can see; and indeed it is hard to imagine how any such conclusion could possibly be 'proved' by Homer, who has never even heard of the Hittites (the *Keteioi* of the Odyssey notwithstanding; they are no more *Hittites* there than in Alcaeus).

It is nevertheless justice, and a pleasure, to say that this is an exceptionally interesting and useful essay, worth many times its weight. DENYS PAGE

CELTIC HERITAGE: ANCIENT TRADITION IN IRELAND AND WALES. *By* ALWYN REES and BRINLEY REES. *London: Thames and Hudson*, 1961. *pp.* 427, 14 *in-text figures.* 50*s.*

A quotation from Francis Bacon heads the introductory chapter, and part of it may be repeated here as giving a clue to the purpose of the book: '. . . that the mind be enlarged

. . . to the grandeur of the mysteries. . .'. This is a very curious book for despite the clarity of the descriptive passages on Irish and Welsh literature, the real concern of the authors is to elaborate ideas of cosmological symbolism for Celtic literary tradition as a whole, and all this through Brahmanical teaching. To venture to say that such an approach is uncritical and that the presentation is unmethodical, is to invite the authors' scorn for they seem to believe that such procedures are derogatory and hostile. There are of course very good reasons for comparing elements of Celtic and Hindu mythology and institutions, but the undertaking must be within some terms of the realities of time and place. The authors are close followers of the work of Georges Dumézil, but they have not taken the trouble to discuss, if even to read, the more restrained, if not always contrary, views of other eminent scholars. Their bibliography reveals a very one-sided approach, nor is confidence established by their handling of particular literary subjects such as the sources of the Mabinogion. Such mundane disciplines as archaeology find no place here, nor will archaeologists be encouraged by sight of diagrams entitled 'The nine-fold plan', or, amongst others, 'Cosmos and calendar (China)'. At fig. 12, four dots within a blank rectangle show the relative positions of Tara and three other ancient sites in central Ireland. The physical and topographical factors on which these sites depended at different times for their importance are neither shown nor mentioned, and for the purposes of the text the dots could as well have been placed in pairs one above the other. It must be said that the chapters are well referenced to original literary sources, and to selected modern works, but the chapter notes are inconveniently bunched together at the end of the book, and their elaborate contractions necessitate further consultation of a long list of abbreviations in which the bibliography is cast.

T. G. E. Powell

LES OUTILS DE BRONZE, DE L'INDUS AU DANUBE, IV–II MILLÉNAIRE. *By* Jean Deshayes. (Institut Français d'Archéologie de Beyrouth, *Bibliothèque Archéologique et Historique*, vol. LXXI.) *Paris: Geuthner*, 1960. *Two vols., pp.* 451, 224; 67 *plates* (14 *in collotype*), 20 *folding maps*. NF100.

This is a corpus of over 3000 copper and bronze tools from an area roughly bounded by Dalmatia, the Crimea, the Punjab and the Persian Gulf: Egypt is excluded. It is in three parts; technological, typological and historical, followed by classified lists of the tools by types; indexes and a bibliography. The plates are simple line drawings showing the range of variation within the types, amplified by a representative selection in half-tone. Tools only are considered—awls, chisels, axes of all types including shaft-hole 'battle-axes', axe-adzes, knives, sickles and saws are the main forms discussed. The selection is sometimes rather unfortunate in its divisions: single-edged knives only are included, double-edged knives presumably being classed with daggers, and in the shaft-hole axe series the Anatolian types with expanded blades rather unhappily named "halberds" by Stronach (*Anat. Stud.*, VII, 1957, 120) are excluded, presumably on account of their military overtones. There are inexplicable gaps in the Eastern European material, and the later developments of the shaft-hole axe there are not mentioned. Is this because they are considered to be 'battle-axes'; if so, why are the Luristan weapons of prestige of this type included? The boundaries of Deshayes' map cut awkwardly into Transylvanian and adjacent territories, but at least the River Maros is included, so that the failure to mention, for instance, the well-known series of moulds for casting shaft-hole axes (mainly of his Type N) from Pecica is curious. One feels that the author is not really at home in this area.

The systematic ordering of the material has been based on a punched-card system described in this context by J.-C. Gardin of the Beirut Institute a few years ago in a

separate publication (*Le Fichier mécanographique de l'outillage*, 1956). One may complain of over-classification (for instance the shaft-hole axes are divided into fifteen main types, of which Type A alone is further sub-divided into twenty-three!), and the fact that illustrations are not arranged strictly by types and sub-types is irritating. But when these complaints have been made, we are left with an outstanding piece of solid corpus-making which puts our knowledge of an important range of early Near Eastern metal types on a new and sound footing.

In his interpretation and discussion of the material, M. Deshayes stresses the primacy of Iran as an original centre of copper metallurgy in the fifth millennium B.C. at least, with subsequent transmission of types and techniques to Sumer, Cilicia, Palestine and India. The main portion of the book deals with shaft-hole axes, hammer-axes and axe-adzes; types which raise complex problems in both the eastern and the western extremities of their distribution. Here again the author would look for an Iranian origin, with an early spread to Mesopotamia, and by the late third millennium to the Kuban, Anatolia and the Aegean, and into this context would come the earlier Bulgarian and Transylvanian finds in Karanovo IV—Gumelniţa horizons.

Shahi-tump and Chanhu-daro would be representatives of an eastward spread by trade or migration, and we may now add the hoard of six shaft-hole hammer-axes and a trunnion axe from Manikhal in the Gilgit Agency (Jettmar in *Proc. Amer. Phil. Soc.*, CV, 1961, 98), and the axe-adze from Pendzhikent, east of Samarkand (*Kratkie Soobshch.*, XXXIII, 1950, 152) as also likely to be in some way connected with such events. Deshayes, while admitting the problematical nature of the whole situation, suggests that the great Transylvanian series of copper axe-adzes, beginning in Tiszapolgar contexts, may have ultimately Aegean origins. Some of his chronology may be too low, as when he dates Cucuteni B a little before 1500 B.C., even if the C14 date for this culture in a Rumanian site of 2750 ± 60 B.C. may be thought too high. Support for his chronology of the Poliochni type of shaft-hole axe in the second half of the second millennium B.C., however, is given by the Pecica evidence which he has not used, as well as by such finds as the Hajdu Samson hoard outside his area, as against the claim by Childe that the Poliochni axe itself came from a context contemporary with Troy II (*Acta Arch. Hungarica*, VII, 1956, 291).

In dealing with the single edged knives, Deshayes shows a wise caution, and is rightly critical of the thesis, championed by Milojčić and others, that these show a Central European influence on the Aegean in the Late Bronze Age. Rather, with Miss Sandars, he points to local developments in the latter area which give rise to forms with Urnfield analogies and would, if anything, see influences in the reverse direction.

We must be grateful for the publication of so much material of critical importance to Near Eastern, Aegean and East European Bronze Age studies: would it be asking too much for a complementary survey of weapons?

STUART PIGGOTT

THE CRETAN COLLECTION IN OXFORD. The Dictaean Cave and Iron Age Crete. *By* JOHN BOARDMAN. *Clarendon Press: Oxford University Press*, 1961. *pp.* x + 180, *frontispiece*, 57 *line figures*, 48 *plates*. 105*s*.

The second title explains and defines the first; thus this book does not attempt to deal with the Minoan Antiquities in Oxford, except such as were found in the Dictaean Cave or in the Idaean Cave, nor of any antiquities that might be in Oxford outside of the Ashmolean Museum. We have now, thanks to the efforts of Doro Levi, Emil Kunze, James Brock and others, a fair idea of the development of Cretan art in the Early Iron Age but for these important cave sanctuaries we have had to rely largely on out of date publications by

Halbherr, Hogarth and others, and this need is admirably satisfied by the book reviewed which is very accurate and well balanced, extremely readable and a credit both to the author and to the publisher.

Chapter I describes the materials from the Cave at Psychro, including not only those now in Oxford but also those objects which are still in Herakleion and even if this appears to go beyond the terms of reference it would be a churlish reader who would complain of what constitute perhaps the most valuable contribution in the book.

Now at last we can study the cave deposits from Psychro, Patso and Nidha in their entirety without wondering whether our conclusions are vitiated by the fact that the collection we happen to be studying may not be fully representative of that particular cave.

Boardman has assembled very carefully all the relevant information so far as he was permitted by the sketchy character of some of the earlier reports. It is certainly regrettable that the primitive hand burnished bucchero described by Hogarth from the lowest levels of the Dictaean cave seems not to have been preserved since this might well have been sub-Neolithic pottery of EM I date whereas the earlier pottery in Oxford does not precede the MM III period.

The most interesting object from Patso was the unique 'Darby and Joan' group recorded in Evans's notebook, but of which the present whereabouts unfortunately are unknown. The dagger from the same site, if the drawing is accurate, seems lopsided enough to be a halberd. Equally interesting is the janiform head from Piskokephalo where the male head may have been added as an afterthought. It seems not impossible that both these objects may reflect a prolongation of one of the old Minoan cults of a goddess and her subsidiary male deity. Head vases such as the 'Old man of Brak' appeared at an early date in the fertile crescent and one well-known example of MM III date was found at Phaistos. The leaden axe-adze might be Minoan I think, though it might also be later and bears a strong resemblance to a miner's pick (see my 'Battle Axes in the Aegean', *Proc. Prehist. Society*, 1950, p. 62, pl. IV). The strange bronze Herakleion No. 1816 does look vaguely Celtic, and the list of objects from the Aegean with definitely Central European connexions such as the Mycenae halberd and palstave mould and the amber spacer beads from Kakovatos, though still scanty, is now increasing. The very naturalistic crawling baby is startling but the casting and rough finish support the author's contention that the figure is Minoan and akin to the ivory boys of Palaikastro. The most interesting object in Oxford from the Idaean Cave is the splendid bronze head vase illustrated on the frontispiece. It is not very closely parallel to anything else but should be grouped, the author suggests, with the latest of the Idaean shields, about 650 B.C. according to the latest chronological scheme for these. Chapter V consists of an excellent summary of Cretan art from the 10th to the 6th centuries B.C. which the author treats more summarily than Demargne but with a conscious attempt to define the main trends, employing the chronology and terminology evolved by Brock. The Geometric tradition persists in the bronze tripod cauldrons and we may note an especially Cretan group with rectangular stands. The orientalizing art of the 8th and 7th centuries B.C. is best represented by the Idaean and other related bronzes and by jewellery such as that from the Khaniale Tekke tomb. Parallel with these is a sub-geometric tradition which is mainly illustrated by the pottery whereas the Daedalic sculpture and clay modelling is developed more from the orientalizing art.

The 6th century is mainly illustrated by pieces of armour but the Olympia corselets often regarded as Cretan work, are considered by Boardman to be rather made in the Peloponnese by Cretan artists or by men inspired by Cretan models. In general, however, the 6th century remains curiously blank and in the author's closing words 'the island is empty of sculpture and architecture which might match the achievements of her artists overseas'.

R. W. HUTCHINSON

THE ART OF ROMAN GAUL. A thousand years of Celtic Art and Culture. *Text by* MARCEL POBÉ, *photographs by* JEAN ROUBIER, *foreword by* T. G. E. POWELL. *The Gallery Press Ltd.*, 1961. *pp.* 78, 259 *photographs, map on end-papers.* 84*s.*

Hitherto it has been impossible to consult a comprehensive series of photographs of the art of Roman Gaul without having recourse to the few libraries which are rich enough or lucky enough to possess Espérandieu's fourteen-volume collection, *Les sculptures et bas-reliefs de la Gaule romaine*. The great merit of the present book is that it has made available a large number of such photographs at a price which, if somewhat high for average pockets, puts it within reach of most libraries. Among the groups which will be found of special interest and usefulness are the scenes from daily life (nos. 206–218), the Celtic deities which survived into Roman times (173–185); the early Christian sarcophagi (227–255).

The sculptures from Entremont and related sites in the south of France (25–46) show the regional Celtic art which developed under Mediterranean influence before the coming of Rome. These pictures are worth having on any terms, but do they show the art of Roman Gaul? The fact is that the title and sub-title of the book are mutually exclusive. Important though the Celtic undercurrents in the art of Roman Gaul may be—and many of the Celtic survivals are much more attractive than some of the duller stereotyped classical art of the province—the art of Roman Gaul cannot strictly be described as Celtic art, and Roman Gaul certainly did not embrace a thousand years. It may be pedantic to insist, but 'Art in Celtic and Roman Gaul' would have been more exact.

Some readers will feel that the authors have spread their net too wide, which has resulted in dilution rather than elucidation. The photograph of a megalithic monument in its background of birch trees (no. 1) is in itself delightful, but is it relevant? M. Pobé believes that it is, but there is on the whole rather too much of this picture-book charm which for the serious student adds to the expense of the book without increasing its value: the rocks of no. 17 and the avenue of the Aliscamps are other cases in point. The proportion of architectural photographs is high and includes the rough houses of Entremont, the Greek walls of St. Blaise, round huts of a kind which has been wrangled over for years by French archaeologists, and yet there is no example of the theatre-amphitheatres of Romano-Celtic Gaul which are a distinctive feature of the Celtic provinces, and the only note about the Romano-Celtic square and round temples is that for no. 153 (Autun) which seems to have suffered in translation. The commentary does not greatly advance the subject and is marred by infelicitous translation and too many misprints. The best part of the text is that about the more Celtic aspects of the art and here a good deal of information may be gleaned, though one would have expected some attempt to distinguish the cultures represented by the Entremont heads from that of the curious hooded heads from Nimes Museum (41 and 42).

In the Roman section some old familiar clichés rear their heads, among them the well-worn remarks about the deleterious effects of Roman baths. Housewives will hardly agree that the equipment in the kitchen at Vasio 'would not shame any modern kitchen' (p. 26). It is a bit surprising to read about the barbarians on the frontier 'whom detergents will not deter' (p. 31). A number of small inaccuracies detract from the value of the volume. Nimes is not 'on the right bank of the Rhône', but nearly 20 miles west of it; the Barbegal mill was worked by two parallel leats, not a single one (no. 89); in plate 84 why say the two women are hand in hand when they plainly are not? and the daughter of Zairus (241) is, to us, the daughter of Jairus.

To sum up, there is much that is fine in this book and it will be found valuable by the scholar able to discriminate among its statements. It will open new vistas of Roman Gaul to the non-specialist, but more critically produced its value would have been enhanced.

OLWEN BROGAN

# Index

*Books and journals reviewed or mentioned are in italics*


*Achaeans and Hittites, by* G. L. Huxley, 328
Across the North Sea: A Review, *by* J. V. S. Megaw, 45
Administration of Roman Britain, The, *by* J. C. Mann, 316
Aerial Reconnaissance in Wales, *by* J. K. S. St. Joseph, *illus.*, 263
Alcock, Leslie. The Winged Objects in the Llyn Fawr Hoard, *by, illus.*, 149
Aldred, Cyril. *The Egyptians, by*, 159; review by, 169
Ancient Forest of Blackamore, The, *by* G. W. Dimbleby, 123; *by* H. Godwin, 244
Antiquity Trust, The, 90
*Antonine Wall, The, by* Anne S. Robertson, 79
*Archaeology in the Holy Land, by* Kathleen M. Kenyon, 68
*Archaeology of Weapons, The, by* R. Ewart Oakeshott, 75
Art in Roman Britain, *illus.*, 246
*Art of Roman Gaul, The, by* M. Pobé, 333
Artistry and Roman Britain, *by* I. A. Richmond, 243
Ashbee, Paul. *The Bronze Age Round Barrow in Britain, by*, 67; *and* Ian W. Cornwall, An Experiment in Field Archaeology, *by, illus.*, 129
Aspects of Palaeolithic Art, *by* Charles McBurney, 107
*Assyrian Palace Reliefs, by* R. D. Barnett, 76
Atkinson, R. J. C. Neolithic Engineering, *by*, 292; review *by*, 248
*Attic Geometric Workshops, by* J. M. Davison, 251
Australia. *See* Radiocarbon Dates

Bailloud, Gerard. Review by, 71
Barker, H. Potassium-Argon Dating, *by*, 59
Barley, W. M. *The English Farmhouse and Cottage, by*, 249
Barnett, R. D. *Assyrian Palace Reliefs, by*, 76
Biddle, Martin. Sudanese Pottery in England: A Warning, *by*, 60
Blance, Beatrice. Early Bronze Age Colonists in Iberia, *by, illus.*, 192
Boardman, John. *The Cretan Collection in Oxford, by*, 331; The Knossos Tablets: An Answer, *by*, 233
Bogaers, J. E., Glasbergen, W., Glazema, P. *and* Waterbolk, H. T. *Honderd Eeuwen Nederland, by*, 45
Boon, G. C. A Medal of the Lake Dwellings, *by, illus.*, 144; *Isca: The Roman Legionary Fortress at Caerleon, Mon., by*, 254
Braidwood, R. J. Review by, 321; *with* Bruce Howe, *and others, Prehistoric Investigations in Iraqi Kurdistan, by*, 322
Bray, W. Review by, 327
Brennan, Louis A. *No Stone Unturned, by*, 70
British Archaeology Abroad, 66
Brogan, O. Review by, 333
*Bronze Age Round Barrow in Britain, The, by* Paul Ashbee, 67
Bronze Sword from Cyprus, A New, *by* Hector Catling, *illus.*, 115
Brothwell, D. R. Cannibalism in Early Britain, *by*, 304
Bruce-Mitford, R. Prehistoric and Romano-British Antiquities in the British Museum, *by*, 313
Burney, Charles. Circular Buildings found at Yanik Tepe, in N.W. Iran, *by, illus.*, 237
Burton Howes, Note on the, *by* Raymond H. Hayes, 128
Bushnell, G. H. S. Radiocarbon Dates and New World Chronology, *by*, 286; reviews by, 70, 168

Cambridge Ancient History, The, 311
Cannibalism in Early Britain, *by* D. R. Brothwell, 304
Catling, Hector. A New Bronze Sword from Cyprus, *by, illus.*, 115
*Celtic Heritage: Ancient Tradition in Ireland and Wales, by* A. *and* B. Rees, 329
Circular Buildings found at Yanik Tepe in N.W. Iran, *by* Charles Burney, *illus.*, 237
Civitas: A Myth, *by* Sheppard Frere, 29; A Further Comment, *by* J. C. Mann, 142.
Clark, J. G. D. *World Prehistory—An Outline, by*, 321; review by, 73.
Clarke, R. Rainbird. *East Anglia, by*, 73
Cole, Sonia. Forgeries and the British Museum, *by, illus.*, 103
Coles, J. M. C.B.A. Conference on the British Bronze Age, *by*, 63
Conference on the Iron Age in N. Britain, 245
Cook, R. M. Review by, 251
Cornwall, Ian W. *See* Ashbee, Paul
C.B.A. Conference on the British Bronze Age, *by* J. M. Coles, 63
COWA Surveys and Bibliographies, 156
Coursaget, J., Giot, P. R., *and* Le Run, J. New Radiocarbon Dates from France, *by*, 147
Courtyard House Site, The, at Higher Bodinnar, Sancreed, Cornwall, *plan, by* P. A. S. Pool, 314
Cowen, J. D. The Late Bronze Age Chronology of Central Europe: Some Reflections, *by*, 40

*Cretan Collection in Oxford, The, by* John Boardman, 331
*Crete and Mycenae, by* S. Marinatos, 80

Daniel, Glyn. *The Prehistoric Chamber Tombs of France, by*, 71
Date of the Linear B Tablets from Knossos, The, *by* Sinclair Hood, 4
Davison, J. M. *Attic Geometric Workshops, by*, 251
*Dawn of African History, The, by* Roland Oliver, 324
Deshayes, J. *Les Outils de Bronze, de l'Indus au Danube. IV–II Millenaire, by*, 330
Dickins, Bruce. The Progress of English Place-Name Studies since 1901, *map, by*, 281
Dimbleby, G. W. The Ancient Forest of Blackamore, *by*, 123
Dimitrov, Dimiter P. Seuthopolis, *by, illus.*, 91

Early Bronze Age Colonists in Iberia, *by* Beatrice Blance, *illus.*, 192
*Early Christians, The, by* Michael Gough, 166
Earthwork at Sutton Hoo, An, *by* A. H. A. Hogg, *map*, 53
Earthworms and Archaeology, *by* C. A. Gresham, 235
*East Anglia, by* R. Rainbird Clarke, 73
East Anglian Coast-line Levels Since Roman Times, *by* Charles Green, *maps*, 21; note, 155
*Egypt of the Pharaohs, by* Sir Alan Gardiner, 169
*Egyptians, The, by* Cyril Aldred, 159
*English Farmhouse and Cottage, The, by* M. W. Barley, 249
Evans, E. E. Review by, 247
Evans, J. D. C14 Date for the Maltese Early Neolithic, *by*, 143; review by, 254
Experiment in Field Archaeology, An, *by* Paul Ashbee *and* I. W. Cornwall, *illus.*, 129

*Filitosa et son contexte archéologique dans la vallée du Taravo, by* R. Grosjean, 327
First Farmers in Turkmenia, The, *by* V. M. Masson, *illus.*, 203
First Steps in Archaeology, *by* Margaret Murray, 8
Folly in Cobham Park, The, *by* H. A. James, *illus.*, 151
Forgeries and the British Museum, *by* Sonia Cole, *illus.*, 103
French Prehistoric Congress, 1961, 61
Frend, W. H. C. Review by, 166
Frere, S. S. Civitas—A Myth, *by*, 29; *Problems of the Iron Age in Southern Britain, ed. by*, 252

Garašanin, M. V. The Neolithic in Anatolia and the Balkans, *by*, 276
Gardiner, Sir Alan, *Egypt of the Pharaohs, by*, 166
Giot, P. R. *See* Coursaget, J.
Glasbergen, W. *See* Bogaers, J. E., *and* Laet, S. J. De
Glazema, P. *See* Bogaers, J. E.
Godwin, H. The Ancient Forest of Blackamore, *by*, 244
Golden Statuette of a Celtic Warrior, A, *by* Ole Klindt-Jensen, *illus.*, 53
Goody, J. Review by, 324
Gough, Michael. *The Early Christians, by*, 166
Grant, I. F. *Highland Folk Ways, by*, 247
Green, Charles. East Anglian Coast-line Levels Since Roman Times, *by, maps*, 21; *note*, 155
Gresham, C. A. Earthworms and Archaeology, *by*, 235
Grosjean, R. *Filitosa et son contexte archéologique dans la vallée du Taravo, by*, 327

Hallam, Sylvia: Wash Coast-line Levels since Roman Times, *by*, 152; review by, 165
Hawkes, Christopher. The newly-found Gold Torc from Moulsford, Berks, *by, illus.*, 240
Hayes, Raymond H. Note on the Burton Howes, *by*, 128
*Highland Folk Ways, by* I. F. Grant, 247
Hogg, A. H. A. An Earthwork at Sutton Hoo, *by*, *map*, 53
Holmes, Martin. Review by, 75
*Honderd Eeuwen Nederland, by* J. E. Bogaers, W. Glasbergen, P. Glazema *and* H. T. Waterbolk, 45
Hood, Sinclair. The Date of the Linear B Tablets from Knossos, *by*, 4
Hutchinson, R. W. Niezwiska and the Cucuteni Culture, 142; reviews by, 80, 331
Huxley, G. L. *Achaeans and Hittites, by*, 328

*Indian Life in the Upper Great Lakes, by* G. I. Quimby, 168
International Congress of Prehistoric and Proto-historic Sciences, 156
*Isca: The Roman Legionary Fortress at Caerleon, Mon., by* G. C. Boon, 254

James, H. A. The Folly in Cobham Park, *by, illus.* 151
James, T. G. H. Review by, 159
Jones, Glanville. Settlement Patterns in Anglo-Saxon England, *by, maps*, 221
*Journal of Roman Studies, The*, 157

Kehoe, Thomas F. Stone Tipi Rings, *by*, 145
Kenyon, Kathleen M. *Archaeology in the Holy Land, by*, 68
Kirwan, Lawrence. Preserving an Ancient Church—in a Glass Case, *by, illus.*, 58
Klindt-Jensen, Ole. A Golden Statuette of a Celtic Warrior, *by, illus.*, 53

Knossos Tablets: Date of the Linear B Tablets from, *by* Sinclair Hood, 4; An Answer, *by* John Boardman, 233; The Find Places of the Tablets, *by* L. R. Palmer, *illus.*, 135; Some clarification, *by* L. R. Palmer, *illus.*, 308
Laet, S. J. De. *The Low Countries*, *by*, 45; *and* Glasbergen, W. *De Voorgeschiedenis der Lage Landen*, *by*, 45
Late Bronze Age Chronology of Central Europe, The: Some Reflections, *by* J. D. Cowen, 40
Leisner, G. *and* V. *Die Megalithgräber des Iberischen Halbinsel*, *by*, 254
Le Run, J. *See* Coursaget, J.
Linear B Tablets from Knossos, The Date of, *by* Sinclair Hood, 4; *see also* Knossos Tablets *above*; New Linear B Tablets from Mycenae, *illus.*, *by* Lord William Taylour, 57
Lloyd, Seton. Review by, 325
*Low Countries, The*, *by* S. J. De Laet, 45

McBryde, Isabel. New Radiocarbon Dates for Australia, *by*, 312
McBurney, Charles. Aspects of Palaeolithic Art, *by*, 107; note on Potassium-argon dating, 59.
Maltese Early Neolithic, C14 Date for, *by* J. D. Evans, 143
Mann, J. C. The Administration of Roman Britain, *by*, 316; Civitas—A Further Comment, *by*, 142
Marinatos, S. *Crete and Mycenae*, *by*, 80
Marshall, Sir John, and Gandhāra Art, *by* Daniel Schlumberger, *illus.*, 176
Masson, V. M. The First Farmers in Turkmenia, *by*, *illus.*, 203
*Matter of Time, A*, 165
Mattingley, Harold, *Roman Coins from the Earliest Times to the Fall of the Western Empire*, *by*, 78
Medal of the Lake Dwellings, A, *by* G. C. Boon, *illus.*, 144
Mediterranean Scholarship, 1962, 320
*Megalithgräber des Iberischen Halbinsel, Die*, *by* G. *and* V. Leisner, 254
Megaw, J. V. S. Across the North Sea: A Review, *by*, 45; Penny Whistles and Prehistory, *by*, *illus.*, 55
More on the Mesolithic, *by* Philip E. L. Smith, 61.
Mulvaney, D. J. Australian Radiocarbon Dates, *by*, 37
Munn-Rankin, J. M. Reviews by, 163, 164
Murray, M. A. First Steps in Archaeology, *by*, 8; Pottery Anchors, *by*, 59
*Myrtou-Pighades. A Late Bronze Age Sanctuary in Cyprus*, *by* Joan du Plat Taylor, 159

Navarro, J. M. de. Note on Statuette of a Celtic Warrior, *by*, 53
Nenquin, J. Two Radiocarbon Dates for the Kisalian, *by*, 312
Neolithic in Anatolia and the Balkans, The, *by* M. V. Garašanin, 276
Neolithic Engineering, *by* R. J. C. Atkinson, 292
Neustupny, Evzen. Review by, 161
New Linear B Tablets from Mycenae, *by* Lord William Taylour, *illus.*, 57
Newly-found Gold Torc from Moulsford, Berks, The, *by* Christopher Hawkes, *illus.*, 240
Niezwiska and the Cucuteni Culture, *by* R. W. Hutchinson, 142
*No Stone Unturned*, *by* Louis A. Brennan, 70
Notes and News for March, 1962, 320

Oakeshott, R. Ewart. *The Archaeology of Weapons*, *by*, 75
Oates, Joan. Reviews by, 76, 322
Oliver, Roland. *The Dawn of African History*, *by*, 324
*Outils de Bronze, Les, de l'Indus au Danube, IV–II Millénaire*, *by* J. Deshayes, 330

Page, D. Review by, 328
Palmer, L. R. The Find Places of the Knossos Tablets, *by*, *illus.*, 135; The Knossos Tablets: Some Clarifications, *by*, *illus.*, 308
Parrot, M. *Sumer*, *by*, 163
Peate, I. C. Review by, 249
Penny Whistles and Prehistory, *by* J. V. S. Megaw, *illus.*, 55
*Pervobytnaya Tekhnika*, *by*, S. A. Semenov, 161
Piggott, Stuart. Reviews by, 67, 330
Pobé, M. *The Art of Roman Gaul*, *by*, 333
Pool, P. A. S. The Courtyard House Site at Higher Bodinnar, Sancreed, Cornwall, *plan*, *by*, 314
Potassium-Argon Dating, *by* H. Barker, 59
Pottery Anchors, *by* M. A. Murray, 59
Powell, T. G. E. Reviews by, 252, 329
*Prehistoric Chamber Tombs of France, The*, *by* Glyn Daniel, 71
*Prehistoric Investigations in Iraqi Kurdistan*, *by* R. J. Braidwood, Bruce How, *and others*, 322
Prehistoric and Romano-British Antiquities in the British Museum, *by* R. Bruce-Mitford, 313
Prehistoric Salt-boiling, *by* Karl Riehm, *illus.*, 181
Preserving an Ancient Church—in a Glass Case, *by* Lawrence Kirwan, *illus.*, 58
*Problems of the Iron Age in Southern Britain*, *ed. by* S. S. Frere, 252
Progress of English Place-Name Studies since 1901, The, *by* Bruce Dickins, *map*, 281

Quimby, G. I. *Indian Life in the Upper Great Lakes*, *by*, 168

Radiocarbon Dates, Australian, *by* D. J. Mulvaney, 37
Radiocarbon Dates for Australia, New, *by* Isobel McBryde, 312
Radiocarbon Dates from France, New, *by* J. Coursaget, P. R. Giot *and* J. Le Run, 147

# INDEX


Radiocarbon Dates, Two, for the Kisalian, *by* J. Nenquin, 312
Radiocarbon Dates and New World Chronology, *by* G. H. S. Bushnell, 286
Rees, A. *and* B. *Celtic Heritage: Ancient Tradition in Ireland and Wales*, *by*, 329
*Revue d'Histoire de la Sidérurgie*, 66
Rice, T. Talbot. *The Seljuks*, *by*, 325
Richmond, I. A. Artistry and Roman Britain, *by*, 243
Riehm, Karl. Prehistoric Salt-boiling, *by*, *illus*, 181
Robertson, Anne S. *The Antonine Wall*, *by*, 79
*Roman Coins from the Earliest Times to the Fall of the Western Empire*, *by* Harold Mattingley, 78
Roman Dams in Tripolitania, *by* Claudio Vita-Finzi, *illus.*, 14
Royal Commission on Ancient and Historical Monuments in Wales: *Caernarvonshire*, Vol. I *East*, Vol. II *Central*, 248

St.Joseph, J. K. S. Aerial Reconnaissance in Wales, *by*, *illus.*, 263
Salzman, L. F. Stonehenge: A Suggestion, *by* 246
Schlumberger, Daniel. Sir John Marshall and Gandhāra Art, *by*, *illus.*, 176
School of African Archaeology, A, 145
*Seljuks, The*, *by* T. Talbot Rice, 325
Semenov, S. A., *Pervobytnaya Tekhnika*, *by*, 161
Settlement Patterns in Anglo-Saxon England, *by* Glanville Jones, *maps*, 221
Seuthopolis, *by* Dimiter P. Dimitrov, *illus.*, 91
Skorba, Malta and the Mediterranean, *by* David Trump, *illus.*, 300
Smith, Philip E. L. More on the Mesolithic, *by*, 61
Steer, Kenneth. Review by, 79
Stewart, James R. Review by, 159
Stonehenge: A Suggestion, *by* L. F. Salzman, 246
Stone Tipi Rings, *by* Thomas F. Kehoe, 145
Sudanese Pottery in England. A Warning, *by* Martin Biddle, 60
*Sumer*, *by* M. Parrot, 163
Summer School on 'The Roman Villa', 66
Sutherland, C. H. V. Review by, 78

Taylor, Joan du Plat, *Myrtou-Pighades*, *by*, 159
Taylour, Lord William. New Linear B Tablets from Mycenae, *by*, *illus.*, 57
Travel Studentship, 245
Trump, David. Skorba, Malta and the Mediterranean, *by*, *illus.*, 300

*Ur in Restrospect*, *ed. by* M. E. L. Mallowan *and* D. J. Wiseman, 164

Vita-Finzi, Claudio, Roman Dams in Tripolitania, *by*, *illus.*, 14
*Voorgeschiedenis der Lage Landen, De*, *by* S. J. De Laet *and* W. Glasbergen, 45

Wash Coast-line Levels since Roman Times, *by*, Sylvia Hallam, 152
Waterbolk, H. T. *See* Bogaers, J. E.
Wheeler, Sir Mortimer. Review by, 157
Wilkins, J. Worsaae and British Antiquities, *by*, 214
Wilson, D. R. Review by, 254
Winged Objects in the Llyn Fawr Hoard, *by* Leslie Alcock, *illus.*, 149
*World Prehistory—An Outline*, *by* J. G. D. Clark, 321
Worsaae and British Antiquities, *by* J. Wilkins, 214

Yadin, Yigael. Review by, 68

# STRATIFICATION

## FOR THE ARCHAEOLOGIST

## Edward Pyddoke

*Secretary and Registrar of the Institute of Archaeology*

This book fulfils a long standing need for an authoritative work introducing the great variety of deposits in which antiquities are discovered, and the processes which lead to their becoming buried and preserved. In his foreword Prof. Sydney Wooldridge, the distinguished professor of Geography in the University of London, writes "As a clear, attractive and persuasive introduction to the lines of thought here developed I could wish students no better beginning than Mr. Pyddoke's book."

*With frontispiece, 8 pages of plates and diagrams in the text.* 30s. net

***Also a companion volume***

## Soils for the Archaeologist

### DR. I. W. CORNWALL

"No archaeological library, institutional or individual, can afford to be without this important book."

*Antiquaries Journal*

50s. net

A Wiltshire book to make you laugh aloud is **JOHN BAKER'S** endearing

**COTTAGE BY THE SPRINGS** (10s. 6d.)

"He is a born writer, his simple little book is a commonplace which is a marvel!"

*John O'London's*

**Send for 4-page descriptive prospectus of books on archaeology published by**

# PHOENIX

***10-13 BEDFORD STREET, LONDON, W.C.2***

## Mycenaeans and Minoans

### L. R. PALMER

*Aegean pre-history in the light of the Linear B tablets*

Professor Palmer presents the results of research into the Mycenaean Greek texts recovered from the Bronze Age palaces of Greece and Crete. The most revolutionary part of the book is the second half where a synthesis is attempted between the philological and archaeological evidence. The author maintains that the Knossos tablets, far from being earlier than the Pylos tablets, are somewhat later. The controversy about Professor Palmer's thesis still continues. With 44 plates, many diagrams and drawings, 5 maps and a table. 30/-

## Ancient Egypt

*A Cultural Topography*

### HERMANN KEES

"This is Egyptology with a difference . . . Based on research . . . and the author's intimate knowledge of both ancient and modern Egypt, it shows how the natural characteristics of the land influenced Egyptian civilisation and affected the development of society."

—TIMES LITERARY SUPPLEMENT

With 46 photographs and 11 maps. 42/-

## Palaeolithic Art

### PAOLO GRAZIOSI

"This sumptuous volume is in a class by itself . . . For the first time the total range of artistic achievement in Upper Palaeolithic times can be appreciated within the compass of the pages and plates of a single volume."

—DR KENNETH OAKLEY, MUSEUMS JOURNAL

With 795 half-tone plates, 55 colour plates, and 363 drawings. 12 gns

**FABER & FABER LTD**

*24 Russell Square, London WC1*

# HELLENIC TRAVELLERS CLUB

## 1962 HELLENIC CRUISES

*Under the Patronage of the Vice-Chancellors of Oxford, Cambridge, Aberdeen and Reading Universities*

**CRUISE No. 28** — **30th March to 15th April, 1962**

### YUGOSLAVIA, GREECE, TURKEY

Venice, Dubrovnik, Pylos, Eglianos, Knossos, Gortyna and Phaestos or Mallia, Rhodes, Lindos or Philerimos and Kamiros, Patmos, Ephesus or Priene, Pergamum, Bosphorus, Istanbul, Thasos, Philippi, Athens—2 days with optional 1-day visit to: Daphni, Osios Loukas and Delphi; or Old Corinth, Mycenae and Epidauros; or Aegina, Hydra and Poros; Sounion, Delos, Milos, Olympia, Korcula, Venice.

**CRUISE No. 29** — **14th April to 30th April, 1962**

### YUGOSLAVIA, GREECE, TURKEY, LEBANON, CYPRUS

Venice, Dubrovnik, Olympia, Athens, Daphni and Eleusis or Sounion, Delos, Antalya, Perge, Aspendos, Beirut (Optional 2-day visit by air to: Petra; or Baalbek, Damascus and Palmyra; or Baghdad and Babylon. Optional 1-day visit to: Jerusalem; or Amrit, Tortosa and Krak des Chevaliers), Baalbek, Dog River, Byblos, Famagusta, Salamis, Nicosia, St. Hilarion, Bellapais, Kyrenia, Rhodes, Kamiros, Knossos, Lepanto, Delphi, Venice.

**CRUISE No. 30** — **29th April to 15th May, 1962**

### YUGOSLAVIA, GREECE, TURKEY

Venice, Dubrovnik, Olympia, Knossos, Antalya, Perge, Aspendos, Side, Rhodes, Lindos or Philerimos and Kamiros, Delos, Mykonos, Cape Helles, Gallipoli Peninsula, Troy, Bosphorus, Istanbul, Ephesus or Priene, Athens, Daphni and Eleusis or Sounion, Mistra, Sparta, Delphi, Korcula, Venice.

**CRUISE No. 31** — **15th August to 31st August, 1962**

### ITALY, SICILY, GREECE, TURKEY

Genoa, Salerno, Paestum, Palermo, Segesta, Syracuse, Olympia, Knossos, Santorini, Rhodes, Lindos or Philerimos and Kamiros, Delos, Mykonos, Samothrace, Troy, Bosphorus, Istanbul, Ephesus or Priene, Athens, Daphni and Eleusis or Sounion (Optional overnight stay in Athens with visit to: Daphni, Osios Loukas and Delphi; or Daphni, Corinth Canal, Mycenae and Old Corinth), Venice.

**CRUISE No. 32** — **30th August to 15th September, 1962**

### YUGOSLAVIA, GREECE, TURKEY, BLACK SEA, RUMANIA, BULGARIA

Venice, Dubrovnik, Olympia, Knossos, Santorini, Pergamum, Istanbul, Bosphorus, Constanta, Mamaia, Bucharest (with overnight stay), Stalin (Varna), Nessebur, Bourgas, Troy, Delos, Tinos, Mykonos, Athens, Daphni and Eleusis or Sounion (Optional overnight stay in Athens with visit to: Daphni, Osios Loukas and Delphi; or Daphni, Corinth Canal, Mycenae and Old Corinth), Venice.

**CRUISE No. 33** — **14th September to 30th September, 1962**

### YUGOSLAVIA, GREECE, TURKEY

Venice, Dubrovnik, Olympia, Tiryns, Epidauros, Aegina, Knossos, Gortyna and Phaestos or Mallia, Rhodes, Lindos or Philerimos and Kamiros, Patmos, Ephesus or Priene, Pergamum, Bosphorus, Istanbul, Troy, Samothrace, Delos, Tinos, Mykonos, Athens, Daphni and Eleusis or Sounion (Optional overnight stay in Athens with visit to: Daphni, Osios Loukas and Delphi; or Daphni, Corinth Canal, Mycenae and Old Corinth), Venice.

**Each Cruise will be accompanied by five Guest Lecturers who will give lectures on board and at the various sites visited. Guest Lecturers accompanying 1962 Cruises include—**

Mr. John **Boardman**, Sir Maurice **Bowra**, Mr. John C. **Dancy**, Mr. M. I. **Finley**, Dr. Michael **Grant**, Professor P. H. J. **Lloyd-Jones**, Sir Harry **Luke**, Mr. Michael **Maclagan**, Dr. Walter F. **Oakeshott**, Canon Guy **Pentreath**, Mr. Stewart H. **Perowne**, Professor Ian A. **Richmond**, Professor W. B. **Stanford**, Professor H. R. **Trevor-Roper**, The Rev. Lawrence **Waddy**, Professor T. B. L. **Webster**, Sir Mortimer **Wheeler**, and Sir John **Wolfenden**.

**PRICES FROM 100 GNS.** (Including travel LONDON–VENICE and return).

*For full particulars and reservations apply to:*

## W. F. & R. K. SWAN (Hellenic) LTD.

### 260-261 (P9) TOTTENHAM COURT ROAD, LONDON, W.1

**Telephones: MUSeum 8070 (18 lines)**

SOCIETY FOR HELLENIC TRAVEL

# CRUISE PROGRAMME—1962

*Fast, modern ships are used for the three cruises outlined below, thus enabling passengers to spend longer at many ports of call—in particular in Athens where two days are spent on each cruise—in Istanbul and in Haifa. Cruise* 18 *is operated in the* m.s. Moledet (La Patrie) *7,800 g.r. tons, built in 1961; and cruises* 19 *and* 20 *in the* s.s. Jerusalem *10,000 g.r. tons and built in 1957. Both ships are fitted with Denny-Brown anti-roll stabilizers, are fully air-conditioned and are equipped with the latest navigational devices.*

## CRUISE 18 — 14th to 30th April

to ITALY, GREECE AND THE HOLY LAND in the *m.s. Moledet*

*visiting* MARSEILLES, CIVITAVECCHIA—for OSTIA ANTICA & TARQUINIA: SALERNO—for PAESTUM & POMPEII: ATHENS, HAIFA—where Easter is spent, with numerous alternative excursions to Biblical and archaeological sites, including NAZARETH, the SEA OF GALILEE and the MOUNT OF THE BEATITUDES; JERUSALEM and EIN KEREM; MEGIDDO, BEIT SHE'ARIM and CAESAREA; and the early Byzantine site of AVDAT in the Negev, from BEER SHEBA. The cruise concludes by visiting SANTORIN, DELPHI & OLYMPIA on its way back to Marseilles.

## CRUISE 19 — 15th to 31st May

to the AEOLIAN ISLANDS, GREECE AND TURKEY in the *s.s. Jerusalem*

*visiting* MARSEILLES, LIPARI, CRETE—KNOSSOS & PHAESTOS—EPHESUS or PRIENE, BURSA, THE BOSPHORUS, ISTANBUL—where two days are spent—THE ISLANDS OF LEMNOS, DELOS & MYCONOS, ATHENS—for two days—MISTRA and Marseilles.

## CRUISE 20 — 9th to 25th August

to SARDINIA, SICILY, GREECE & THE GREEK ISLANDS in the *s.s. Jerusalem*

*visiting* MARSEILLES, CAGLIARI—NORA—BARUMINI—AGRIGENTO, SYRACUSE—with an optional expedition to PIAZZA ARMERINA—ATHENS—for two days—THE ISLANDS OF SKIATHOS, SKOPELOS & THASOS, PHILIPPI, MOUNT ATHOS, THE ISLANDS OF DELOS AND CORFU, DELPHI and Marseilles.

*Five Guest Lecturers will accompany each cruise, including*

Mr. Edward Bacon, B.A., The Rev. J. Corbishley, S.J., M.A., Dr. Glyn Daniel, M.A., Ph.D., F.S.A., Mr. R. W. Feachem, M.A., M.Sc., F.S.A., Mr. M. R. E. Gough, M.A., F.S.A., Professor W. K. C. Guthrie, M.A., F.B.A., Litt.D., Professor H. A. Harris, M.A., Mr. R. A. Higgins, M.A., Lord Kinross, Dr. G. L. Lewis, M.A., D.Phil., Mr. Seton Lloyd, C.B.E., M.A., F.B.A., Professor Stuart Piggott, D.Litt.Hum., F.B.A., F.S.A., Mr. Oleg Polunin, M.A., F.L.S., The Rev. B. M. G. Reardon, M.A., Mr. Cecil Stewart, M.A., F.R.I.B.A., Professor C. A. Trypanis, M.A., D.Phil.

**The very wide price range from 99 gns in the *m.s. Moledet* and from 100 gns in the *s.s. Jerusalem* (and lower prices for students), includes plenty of two-berth cabins in the middle and lower priced categories. In all cases, the journeys to and from Marseilles with meals en route, as well as all advertised shore excursions, are included in the price.**

*For booking and all further particulars, apply to the Organizers and Sole Agents*

**FAIRWAYS & SWINFORD (TRAVEL) LTD.**

**18 ST. GEORGE STREET, HANOVER SQUARE, LONDON, W.1**

# Antiquity

## EDITORIAL NOTICES

ANTIQUITY is published quarterly on the 1st March, June, September and December for Antiquity Publications Ltd., by W. Heffer & Sons Ltd., Cambridge, England.

The ANNUAL SUBSCRIPTION (including postage) is ONE POUND TEN SHILLINGS Sterling, or FIVE DOLLARS, *payable in advance to* ANTIQUITY, c/o W. Heffer & Sons Ltd., 104 Hills Road, Cambridge, England. SINGLE COPIES may be obtained for 10*s* 6*d*.

MSS (whether in the form of Articles or Notes) offered for publication should be sent to DR GLYN DANIEL, St. John's College, Cambridge, England. All MSS should be typewritten. The Editor is not responsible for the opinions expressed by contributors.

BOOKS for REVIEW should be addressed to the EDITOR OF ANTIQUITY, St John's College, Cambridge, England.

INDEX and BACK NUMBERS from W. Heffer & Sons Ltd., Booksellers, Petty Cury, Cambridge, England.

BINDING: John Bellows Ltd., Printers and Publishers of Eastgate, Gloucester, will continue to assist those wishing to bind their copies of ANTIQUITY. Binding cases only are 8*s* 6*d*; the cost of binding each volume is 15*s* (including case and return postage). Please write direct to John Bellows Ltd.

**INDEX to ANTIQUITY vols. I-XXV 1927-1951**

4to clothbound 1956 - £2 10s. or $7.50 post free

Copies of the INDEX and BACK NUMBERS

are available from:—

W. HEFFER & SONS LTD.

BOOKSELLERS, PETTY CURY, CAMBRIDGE

to whom all enquiries should be sent

# The Dawn of Civilization

EDITED BY **Professor Stuart Piggott** CHAPTERS BY **James Mellaart Professor M. E. L. Mallowan Cyril Aldred William Culican Seton Lloyd M. S. F. Hood Sir Mortimer Wheeler William Watson Anthony Christie E. D. Phillips T. G. E. Powell G. H. S. Bushnell**

---

'If man, faced with the final extinction of his species, was commanded to render an account of himself, he might well proffer this book as a first chapter. For it does exactly what its title suggests—describes the dawn, not the fulfilment, of Civilization.'

*Sunday Times*
LEONARD COTTRELL

*The Sunday Telegraph*
GLYN DANIEL

'A major event in British publishing . . . a major event in the history of the popularisation of archaeology . . . the *best* world survey of human cultures in early times . . . this is unquestionably an authoritative book and Professor Piggott is to be congratulated on having been able to persuade such a fine team to work for and with him for the past three years.'

'. . . comes into our hands as a remarkable feat of publishing and of scholarly collaboration . . . a fine achievement—and very good value.'

*The Observer*
JACQUETTA HAWKES

*The Economist*

'The aim of this book is to sift the evidence and survey the foundations of civilization on a world-wide basis. The result, complex, authoritative yet still questing, is pre-eminently exciting.'

'Every page is a feast for the eye and a delight to the mind . . . *The Dawn of Civilization* is indeed a monumental work, in scope, in presentation and execution, a landmark in educational literature.'

*John O'London's*
HUGH SCHONFIELD

*Yorkshire Post*

'Let me beg every school, public library and cultural institution whatsoever to buy it; and let me further urge all parents concerned for their children's education to do likewise . . . Young minds will get much, much more from it than a visual feast.'

---

**172 colour plates 440 monochrome illustrations 205 original line drawings**
**110 original reconstructions and plans size 14″ × 10½″ £8 8s**

# Thames & Hudson

**30 Bloomsbury Street, London, W.C.1**

Printed in Great Britain for ANTIQUITY PUBLICATIONS LTD., by W. Heffer & Sons Ltd., Cambridge